View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by Indiana University Bloomington Maurer School of Law

Maurer School of Law: Indiana University
Digital Repository @ Maurer Law

Articles by Maurer Faculty | Faculty Scholarship

2014

Power and Governance in Patent Pools

Michael Mattioli
Indiana University Maurer School of Law, mmattiol@indiana.edu

Follow this and additional works at: http://www.repository.law.indiana.edu/facpub


Part of the Intellectual Property Law Commons, and the Science and Technology Law Commons

Recommended Citation
Mattioli, Michael, "Power and Governance in Patent Pools" (2014). *Articles by Maurer Faculty*. Paper 1301.
http://www.repository.law.indiana.edu/facpub/1301

This Article is brought to you for free and open access by the Faculty Scholarship at Digital Repository @ Maurer Law. It has been accepted for inclusion in Articles by Maurer Faculty by an authorized administrator of Digital Repository @ Maurer Law. For more information, please contact wattn@indiana.edu.

LAW LIBRARY
INDIANA UNIVERSITY
Maurer School of Law
Bloomington

Harvard Journal of Law & Technology
Volume 27, Number 2 Spring 2014

POWER AND GOVERNANCE IN PATENT POOLS

*Michael Mattioli**

TABLE OF CONTENTS

I. INTRODUCTION

The recent influx of patent pools, research consortia, and similar cooperative groups led by companies at the vanguard of American innovation has raised a pressing question: How does collective action influence the incentive to innovate? This question hinges on how patent pools are internally governed — a topic that has not been deeply examined by legal scholars.[1] Through an original study of fifty-two

* Associate Professor of Law, Indiana University Maurer School of Law. I am grateful to Rebecca Eisenberg, Robert Merges, Gideon Parchomovsky, Mark Janis, Marshall Leaffer, and Liza Vertinsky for their helpful comments on earlier drafts of this Article. I also wish to thank participants of the 12th Annual Intellectual Property Scholars Conference and participants of the 3rd Annual Patent Conference. Finally, this Article owes a debt to the resourceful librarians of the National Archives and Research Administration, the Wisconsin Historical Society, and the New York State Library.

1. For the most detailed empirical examinations of patent licensing collectives to date, see generally FLOYD L. VAUGHAN, ECONOMICS OF THE PATENT SYSTEM (1925) (containing short accounts of many patent pools that were the subject of antitrust litigation in the late nineteenth and early twentieth centuries); FLOYD L. VAUGHAN, THE UNITED STATES

private agreements, this Article pulls back the veil on patent licensing collectives to examine whether such organizations are designed to encourage long-term innovation.

This study is prompted by a widely perceived crisis in our patent system.[2] Today, mosaics of thousands of patents held by many different owners are believed to cover the technologies that fuel our economy — e.g., pharmaceuticals, biotechnology, and software.[3] In this age of dispersed entitlements, "downstream" technology users are burdened with the high costs of identifying, evaluating, and negotiating licenses for multitudes of "upstream" patent rights.[4] Moreover, patent holders who learn that their cooperation is essential to a licen-

PATENT SYSTEM (1956) (expanding on Vaughan's 1925 book with new accounts of patent pools, including a large number that formed during the 1930s). In a 2007 publication, Josh Lerner, Marcin Strojwas, and Jean Tirole examined aspects of these collectives unrelated to internal governance. *See generally* Josh Lerner et al., *The Design of Patent Pools: The Determinants of Licensing Rules*, 38 RAND J. ECON. 610 (2007) (examining grant-back provisions and independent licensing in patent pools). Studies of more recent patent licensing organizations also do not focus on internal governance or collective choice arrangements. *See, e.g.*, Anne Layne-Farrar & Josh Lerner, *To Join or Not To Join: Examining Patent Pool Participation and Rent Sharing Rules*, 29 INT'L J. INDUS. ORG. 294, 296–97, 300–02 (2011) (exploring whether fixed rent-sharing rules influence participation rates in contemporary technological standard-setting patent pools).

2. The challenges that face our patent system and the threats that those challenges pose for innovation, economic prosperity, and social welfare are dominant themes of contemporary books and academic articles on patent law. *See generally, e.g.*, JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK (2008) (arguing that the patent system is resulting in a net loss in social welfare, in part because patent rights are excessively distributed among multiple patent holders); DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS, AND HOW COURTS CAN SOLVE IT (2009) (identifying numerous causes behind this perceived "crisis" and charting a new way forward); ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT (2004) (arguing that the patent system creates waste and uncertainty, thereby hindering innovation).

3. *See* Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCI. 698, 698–700 (1998) (discussing the transaction costs imposed by diversely held and complementary upstream patent rights); Michael Mattioli, *Communities of Innovation*, 106 NW. U. L. REV. 103, 110–13 (2012) (describing the problem of "patent gridlock" across industries).

4. *See* BURK & LEMLEY, *supra* note 2, at 76 (describing how the possibility of holdouts can inhibit investments in research and development); Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1160 (2009) (presenting an economic analysis of the patent holdout problem); Mattioli, *supra* note 3, at 114 (likening the holdout problem to the phenomenon of "nail houses," held by holdout homeowners who are stubborn as nails, that dot China's burgeoning metropolises and slow real estate development).

see can strategically hold out for prohibitively high royalties.[5] Experts believe that such costs and risks will leave innovation to languish.[6]

A long-debated solution to this problem is compulsory licensing — or, in the parlance of Entitlements Theory, a shift from "property rules" to "liability rules."[7] In contrast to our current patent system, which permits patent holders to seek injunctions against infringers, a compulsory licensing regime would require patents to be licensed at rates set by an organ of the state, such as a court or Congress.[8] This solution would remove the need for licensees to bargain over patent rights.[9] Consequently, transaction costs and associated risks of holdouts would significantly drop.[10] However, critics of compulsory licensing believe that government authorities tasked with setting royalty rates would under-compensate innovators.[11] This, in turn, would discourage prospective inventors from investing time and money in research and development activities, leading to a drag on innovation. If so, while patent holders may have too much control over the fees they collect under the current regime, they would have too little control over these fees in a compulsory licensing regime.[12]

---

5. *See* Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1160–74 (2008) (describing the holdup or holdout phenomenon in economic terms); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, *in* 1 INNOVATION POLICY AND THE ECONOMY 119, 124–26 (Adam B. Jaffe et al. eds., 2001) (discussing the patent holdout problem).

6. *See* Heller & Eisenberg, *supra* note 3, at 699 ("A proliferation of patents on individual fragments held by different owners seems inevitably to require costly future transactions to bundle licenses together before a firm can have an effective right to develop [future commercial products].").

7. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1106–07 (1972) (presenting a new view of legal ordering in which entitlements are governed by either "property rules" or "liability rules"); *see also* Abraham Bell & Gideon Parchomovsky, *Pliability Rules*, 101 MICH. L. REV. 1, 3–6 (2002) (adding to the existing entitlements framework by presenting new hybrid approaches that incorporate aspects of property rules and liability rules).

8. *See* Martin J. Adelman, *Property Rights Theory and Patent-Antitrust: The Role of Compulsory Licensing*, 52 N.Y.U. L. REV. 977, 1001–02 (1977) (explaining how a compulsory licensing system would work); Richard A. Epstein & F. Scott Kieff, *Questioning the Frequency and Wisdom of Compulsory Licensing for Pharmaceutical Patents*, 78 U. CHI. L. REV. 71, 80–83 (2011) (exploring the possible effect that compulsory licensing could have in the pharmaceutical industry); Cole M. Fauver, *Compulsory Patent Licensing in the United States: An Idea Whose Time Has Come*, 8 NW. J. INT'L L. & BUS. 666, 668–74, 683–85 (1988) (advocating a compulsory patent licensing system).

9. *See* Mark A. Lemley, *Contracting Around Liability Rules*, 100 CAL. L. REV. 463, 475 (2012) (arguing that inefficient liability rules can and do actually encourage private bargaining).

10. *See generally id.*

11. *See, e.g.*, Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CAL. L. REV. 1293, 1299 (1996).

12. *See id.* at 1304 ("[A] liability rule places a ceiling on the value of the entitlement, which can conceivably have devastating incentive effects."); *see also id.* at 1307–08 (discussing fundamental problems with legislative valuation of intellectual property rights).

In a landmark 1996 article, Robert Merges suggested that private collective action can resolve this problem.[13] Merges posited that private licensing groups such as patent pools occupy a middle ground between property regimes and liability regimes.[14] In this middle ground, groups of patent holders enter into private agreements in which they receive the ability to influence (albeit in a limited way) the royalties their inventions command.[15] This is achieved, Merges argued, through collective valuation procedures — e.g., negotiating or voting over decisions that affect royalty sharing.[16]

Support for the foregoing theory, referred to herein as the Theory of Collective Patent Valuation, is suggested by a wealth of scholarly literature on collective valuation regimes in non-patent contexts. The Nobelist Elinor Ostrom, for example, documented communities around the globe that manage scarce natural resources through collective valuation procedures, such as democratic voting.[17] In the United States, law and economics scholars have observed similar collective property valuation systems at work in private condominium and neighborhood associations.[18] Land owners in the arid American West also rely on collective valuation to apportion access to water.[19] Examples like these lend support to the tantalizing possibility that patent holders can form enduring institutions that grant their members greater control over pricing than a compulsory licensing regime would.[20]

If this hopeful theory is accurate, the policy implications would be significant: By granting their members control over pricing, such groups could overcome the risk of under-compensation that exists in compulsory licensing proposals. Such groups would also reduce transaction costs and holdout risks by aggregating complementary patent rights. If patent pools are indeed governed this way, policymakers and the interested public might be able to rely on the market to solve its own problems.[21] As patent licensing collectives form in im-

---

13. *See id.* at 1295–97.

14. *See id.* at 1294–95.

15. *See id.* at 1327–28.

16. *See id.*

17. *See generally* ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (1990).

18. *See* Michael Heller & Rick Hills, *Land Assembly Districts*, 121 HARV. L. REV. 1465, 1512–20 (2008); Thomas W. Merrill, *Direct Voting by Property Owners*, 77 U. CHI. L. REV. 275, 287–99 (2010).

19. *See* Stephen N. Bretsen, *Water Markets as a Tragedy of the Anticommons*, 33 WM. & MARY ENVTL. L. & POL'Y REV. 723, 760–82 (2009).

20. Merges himself noted the use of private voting to manage royalty sharing in a performing rights society and, notably, in a 1917 aircraft patent pool. Merges, *supra* note 11, at 1329–40, 1344–47.

21. *See* Jonathan M. Barnett, *Property as Process: How Innovation Markets Select Innovation Regimes*, 119 YALE L.J. 384, 387–88, 390–91 (2009) (presenting a formal theory that patent holders purposefully share their assets under certain circumstances to facilitate collective innovation and dynamic efficiency).

portant industries, the internal governance of these organizations is not only of academic interest, but also of immediate practical concern.

In search of answers, this Article explores the realities of collective governance in patent pools. This study draws on collective patent license agreements spanning the years 1856 to 2013 and obtained from congressional records, regional repositories of the national archives, Freedom of Information Act ("FOIA") requests directed to the Antitrust Division of the United States Department of Justice ("DOJ"), the Wisconsin State Historical Society, the New York State Library in Albany, and in several instances, directly from patent licensing organizations.[22] These contracts document nearly two centuries of scientific and industrial progress, from nineteenth century steelmaking to modern-day genetic research, and they describe in vivid detail the degree to which members of patent pools can influence their compensation.[23]

Because some patent pools may have gone undocumented, and because many of the records that do exist stem from lawsuits and congressional hearings, there is a potential for sampling bias. In light of the paucity of empirical research on this subject, however, this Article significantly advances what is known about the degree of control over pricing that these groups afford to would-be inventors. Moreover, any sampling bias that does exist could just as easily downplay as exaggerate this Article's chief findings.

The discussion unfolds in three parts: Part II explains the pricing problem that afflicts our patent system and the theory that patent pools address this problem through collective patent valuation. Part III presents an original study of collective agreements that reveals gaps between theory and practice. Part IV discusses the normative results of this study and presents a proposal to mandate the recording of collective patent agreements with a federal agency. A brief conclusion follows.

II. THE PROMISE OF COOPERATION

Leading commentators believe that our patent system, by bestowing monopoly pricing power on patent holders, generates transaction costs that discourage innovation.[24] However, if licensing rates were

22. Identifying, gathering, and reviewing these documents involved judicial, congressional, historical, and news database searches, and correspondence with historians and archivists. Where agreements were unavailable, this study relied on detailed descriptions of agreements provided in court decisions. Stewart Macaulay's landmark 1963 "gap study" of non-contractual relations in business heavily inspired this Article's methodology. *See generally* Stewart Macaulay, *Non-Contractual Relations in Business: A Preliminary Study*, 28 AM. SOC. REV. 55 (1963).

23. *See infra* Appendix.

24. *See supra* note 6.

set by courts, Congress, or regulators, innovators would perceive a risk of under-compensation — a result that would likely reduce innovation investments below optimal levels.[25] Academics, industry participants, and policymakers have long and ineffectively sought to resolve this tension through government reforms.[26] Theory, and possibly empirical evidence, points toward an elegant solution: private collective licensing institutions.[27]

A. The Defect of Bargaining Regimes

Since Thomas Jefferson and James Madison famously debated whether their new republic should grant patents, American progress has been deeply tied to the "nuisance[]" (Madison's term) of monopolies.[28] To illustrate this relationship, scholars often say that patents signify a bargain between our society and its geniuses: In exchange for new and useful innovations, our patent system permits inventors to dictate the prices that consumers and licensees must pay.[29] This fictive bargain was struck in the Patent Act of 1790, and it endures today.[30] However, our understanding of how far the "nuisance" of patent pricing should reach has evolved.

Economic theorists have long viewed our patent system as a trade-off between static and dynamic efficiencies.[31] As instruments of exclusivity, patents spur supra-competitive pricing and sub-competitive levels of production.[32] Consequently, some consumers

---

25. *Compare* Merges, *supra* note 11, at 1307 (arguing that a compulsory patent licensing regime would lead to under-compensation), *with* Lemley, *supra* note 9, at 475 (arguing that non-optimal compulsory licensing rates can actually spur efficient bargaining).

26. *See generally* BURK & LEMLEY, *supra* note 2.

27. *See* Merges, *supra* note 11, at 1327–54 (articulating the theory that intellectual property owners can and often do enter into private "liability regimes" to overcome bargaining problems).

28. Letter from James Madison to Thomas Jefferson (Oct. 17, 1788), *in* THE WRITINGS OF JAMES MADISON: 1790–1802, 274 (Gaillard Hunt ed., 1906) ("With regard to Monopolies, they are justly classed among the greatest nuisances in Government. But is it clear that as encouragements to literary works and ingenious discoveries, they are not too valuable to be wholly renounced?").

29. *See, e.g.*, JAFFE & LERNER, *supra* note 2, at 41 ("This is the tradeoff at the heart of the patent system. We grant monopolies . . . allow[ing] some holders of patent monopolies to earn 'obscene' profits . . . because the prospect of those obscene profits is what drives firms to develop new products and processes . . . .").

30. *See* Patent Act of 1790, ch. 7, 1 Stat. 109–12 (Apr. 10, 1790) (current version at 35 U.S.C.A. § 101 (2012)).

31. *See* Gideon Parchomovsky & Michael Mattioli, *Partial Patents*, 111 COLUM. L. REV. 207, 213–14 (2011) (discussing this view in the context of the historical development of patent scholarship).

32. *See, e.g.*, Arti K. Rai, *The Information Revolution Reaches Pharmaceuticals: Balancing Innovation Incentives, Cost, and Access in the Post-Genomics Era*, 2001 U. ILL. L. REV. 173, 177–78 ("[S]tandard economic theory predicts that a profit-maximizing producer with monopoly power will charge more and produce less than a producer in a competitive market . . . .").

who would have been willing to pay competitive prices for patented products are unable to obtain them.[33] Economists view these abandoned transactions as a social deadweight loss that decreases short-term economic efficiency.[34] However, an ideal patent regime would allow these short-term losses to be outweighed by the long-term dynamic gains that innovation can yield.[35] Viewing patents in these terms, early intellectual property scholars sought policies that would maximize incentives to innovate and minimize lost transactions.[36]

As technology has evolved, so too have scholarly views on the full costs of our patent system.[37] The earliest patents granted by the United States Patent and Trademark Office ("PTO") described complete products.[38] Today, by contrast, the technologies that fuel our economy, such as software and drugs, owe their provenance to hundreds and sometimes thousands of existing inventions that have been patented by different inventors.[39] Innovation in the twenty-first century unfolds before a vast mosaic of pre-existing devices, manufacturing processes, applied algorithms, and scientific research methods. Ours is an age of dispersed entitlements.

In a landmark 1998 article published in *Science*, Michael Heller and Rebecca Eisenberg predicted that the increasing diffusion of technology ownership would threaten long-term innovation.[40] The authors posited that, prior to investing time and money into any avenue of research, would-be innovators would seek to avoid infringing "upstream" patented research tools and methods.[41] This would entail several costly and uncertain steps: identifying all patents of possible relevance to a project, evaluating the scope and quality of those patents, and, finally, negotiating licenses with individual patent own-

33. *See, e.g.*, Parchomovsky & Mattioli, *supra* note 31, at 214.

34. *Id.*

35. *Id.* at 211.

36. *Id.* at 214.

37. *Compare* Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & Econ. 265, 265 (1977) (describing the benefits of the patent system for subsequent innovation), *with* JAFFE & LERNER, *supra* note 2 (describing ways in which the patent system might sometimes impede innovation).

38. *See, e.g.*, U.S. Patent No. 9884X (issued July 2, 1836) (describing a new type of door lock invented by J. McClory); U.S. Patent No. 9430X (issued Feb. 25, 1836) (describing an improvement in firearms invented by Samuel Colt); U.S. Patent No. 72X (issued Oct. 14, 1794) (describing a cotton gin invented by Eli Whitney). The filing dates of these patents are unknown due to the 1836 Patent Office fire.

39. *See* Oren Bar-Gill & Gideon Parchomovsky, *The Value of Giving Away Secrets*, 89 VA. L. REV. 1857, 1868 (2003) ("Cumulative innovation is the hallmark of high-tech industries such as computer software, semiconductors, molecular biology, and pharmacology.") (footnotes omitted).

40. Heller & Eisenberg, *supra* note 3, at 699. Heller and Eisenberg's predictions are rooted in longstanding economic principles. S*ee, e.g.*, Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960) (describing transaction costs — e.g., the costs of identifying and negotiating with willing buyers and sellers — as an unavoidable reality of commerce).

41. Heller & Eisenberg, *supra* note 3, at 698.

ers.[42] In addition to these transaction costs, there is the risk that individual patent holders will strategically hold out for prohibitively high fees during negotiations.[43] Heller and Eisenberg reasoned that the innovators who believed that these costs and risks would be too great would abandon their research plans altogether — a result they famously termed "the tragedy of the anticommons."[44]

The related risk of holdouts is a second source of costs in the patent system.[45] The problem arises when a single buyer must purchase assets — e.g., land, patents, etc. — from numerous monopolists. Each monopolist who learns that her cooperation is essential to the buyer's plan strategically demands an exorbitant fee. This surplus fee (which is distinct from the supra-competitive prices that naturally arise in a monopoly setting) could reach as high as the total value of the buyer's project.[46] What results is a no-win situation: With each new agreement that is formed, the buyer becomes more committed to completing the entire project, and the remaining sellers become emboldened to hold out for ever higher fees.[47] Because buyers cannot pay a surplus to each seller who demands it, projects subject to holdout pricing tend to collapse.[48]

Anticommons theory inspired a shift in scholarly focus away from the short-term costs of patents and toward the impact of patents on long-term innovation. Although foregone innovations cannot be empirically studied, patent bargaining failures have been well-documented by intellectual property commentators.[49] For instance, in the realm of genetic research, Stephen Maurer described a patent exchange initiative that halted at a licensing impasse after years of nego-

---

42. JANET HOPE, BIOBAZAAR: THE OPEN SOURCE REVOLUTION AND BIOTECHNOLOGY 44 (2008) ("Where there are multiple patents in a given field, the cost of identifying which ones are relevant to a particular avenue of research may itself be prohibitive.").

43. *See, e.g.*, *supra* note 4 and accompanying text (explaining the holdout problem).

44. Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621, 624 (1998). The proverbial "tragedy of the commons" is a problem well known to academics in many fields: When the rights to *use* a resource are excessively divided, users will tend to deplete the resource. Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243, 1244 (1968). The tragedy of the anticommons arises, by contrast, when rights to *exclude* others from using a resource are excessively divided. This problem leads to underuse of the resource. Heller & Eisenberg, *supra* note 3 at 698 ("[A] resource is prone to underuse . . . when multiple owners each have a right to exclude others from a scarce resource and no one has an effective privilege of use."). Viewed in this way, both problems can be understood as symmetrical consequences of excessive fragmentation of ownership rights.

45. *See supra* note 4 and accompanying text (explaining the holdout problem).

46. *See* Abraham Bell & Gideon Parchomovsky, *The Hidden Function of Takings Compensation*, 96 VA. L. REV. 1673, 1685–86 (2010).

47. *See id.* at 1685; Thomas J. Miceli & Kathleen Segerson, *Sequential Bargaining and Land Assembly: A New Theory of the Holdout Problem*, 14 AM. L. ECON. REV. 372, 373 (2012) ("[A]s the buyer becomes more committed to the project, sellers are able to extract a larger share of the surplus . . . .").

48. *See* Heller & Hills, *supra* note 18 at 1473.

49. *See, e.g.*, Merges, *supra* note 11, at 1354 (1996).

tiation and planning.[50] Rebecca Eisenberg documented similar problems during her tenure as chair of the National Institutes of Health Working Group on Research Tools:[51] In a 2001 publication, she reported that significant administrative problems involved with conducting patent licensing negotiations delayed and impeded research.[52] Today, some commentators debate the extent of the anticommons problem in various industries, but few dispute that the problem exists.[53]

Experts believe that the courts, the PTO, and Congress are responsible for creating this problem.[54] Commentators have criticized the Federal Circuit, for instance, for encouraging excessive patent filings by relaxing subject matter restrictions in areas such as business methods and human genes.[55] Critics have also faulted the PTO's patent-friendly policies for contributing to a flood of patent filings.[56] Congress has been lambasted as well for enacting legislation such as the Bayh-Dole Act,[57] which opened the door to a surge of new patent filings on the products of federally-funded research.[58] Critics believe that these policies have encouraged researchers to seek patent protection for basic tools and methods that, in an earlier age, would have been freely available.[59]

---

50. *See* Stephen M. Maurer, *Inside the Anticommons: Academic Scientists' Struggle To Build a Commercially Self-Supporting Human Mutations Database, 1999–2001*, 35 RES. POL'Y 839, 840 (2006).

51. *See* Rebecca S. Eisenberg, *Bargaining over the Transfer of Proprietary Research Tools: Is This Market Failing or Emerging?*, *in* EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY 223, 225 (Rochelle Cooper Dreyfuss et al. eds., 2001).

52. *See id.*

53. *But see, e.g.*, Chester J. Shiu, *Of Mice and Men: Why an Anticommons Has Not Emerged in the Biotechnological Realm*, 17 TEX. INTELL. PROP. L.J. 413, 415–16 (2009) (challenging the existence of an anticommons in the realm of biotechnology).

54. *See* Jonathan S. Masur, *Regulating Patents*, 2010 SUP. CT. REV. 275, 276–79 (2011).

55. *See* Melissa F. Wasserman, *The PTO's Asymmetric Incentives: Pressure To Expand Substantive Patent Law*, 72 OHIO ST. L.J. 379, 420–28 (2011). *Compare* State St. Bank & Trust Co. v. Signature Fin. Grp., Inc., 149 F.3d 1368, 1373–75 (Fed. Cir. 1998) (introducing the "useful, concrete and tangible result" test for patentable subject matter), *with In re* Bilski, 545 F.3d 943, 959–60 (Fed. Cir. 2008) (replacing the "useful, concrete and tangible result" test with the "machine-or-transformation" test), *aff'd sub nom.* Bilski v. Kappos, 561 U.S. 593 (2010) (holding that the "machine-or-transformation" test is not the "sole test" for deciding patent eligibility).

56. *See* JAFFE & LERNER, *supra* note 2, at 11–17 (citing these changes within the PTO as the cause of an "explosion" of patent rights). One widely cited study estimated that the PTO granted eighty-five percent of all applications between 1993 and 1998. Cecil D. Quillen, Jr., Ogden H. Webster & Richard Eichmann, *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office — Extended*, 12 FED. CIR. B.J. 35, 38 (2002).

57. *See* Bayh-Dole Act, Pub. L. No. 96–517, 94 Stat. 3015, 3019–28 (codified as amended at 35 U.S.C. §§ 200–11, 301–307 (2012)).

58. *See* Gary Pulsinelli, *Share and Share Alike: Increasing Access to Government-Funded Inventions Under the Bayh-Dole Act*, 7 MINN. J.L. SCI. & TECH. 393, 410–11 (2006).

59. *See, e.g.*, JAFFE & LERNER, *supra* note 2, at 115–19 ("Following the CAFC [*State Street*] decision . . . the number of business method patent applications has exploded . . . .").

The belief that our government's institutions hinder innovation rather than encourage it has inspired a wave of reform proposals, some of which were included in the Leahy-Smith America Invents Act of 2011, that are designed to tailor the initial apportionment of patent rights.[60] Many such solutions would make patents harder to obtain by, for instance, increasing application fees, fortifying the standard for obviousness, and increasing the quality of PTO review.[61] Even bolder suggestions abound, which include placing a hard limit on the total number of patents issued each year and offering new kinds of patents that can be asserted only against certain types of infringers.[62]

It is doubtful that any of these approaches to tailor the government's apportionment of patent rights will remedy the proverbial anticommons. The reason is simple: The transaction costs and holdout risks that fuel the anticommons problem could persist in a world with fewer patents. For example, in an industry where each of four firms holds at least one essential patent, prospective competitors must negotiate with all four firms. And, regardless of the number of patents that each owns, any of these firms could still decide to hold out and thereby cause an entire project to collapse.[63] Ultimately, the true "nuisance" of patent pricing lies not in the *number of patents* in a particular industry but in the *number of patent holders* with whom potential licensees must bargain.[64]

B. The Defect of Liability Regimes

Some experts believe that the defects of bargaining over patent licenses could be avoided if the government, rather than patent holders, were to set patent licensing fees.[65] This solution is rooted in Guido

60. For instance, the America Invents Act encourages third parties to submit prior art that could potentially lead to a rejection of a patent application under consideration by the PTO. Leahy-Smith America Invents Act, 35 U.S.C. § 8 (2012).

61. *See, e.g.*, JAFFE & LERNER, *supra* note 2, at 184 (discussing the use of post-grant reexaminations in eliminating bad patents); Jonathan S. Masur, *Costly Screens and Patent Examination*, 2 J. LEGAL ANALYSIS 687, 688 (2010) (arguing that higher ex ante costs discourage the submission of low-value patent applications).

62. *See* Ian Ayres & Gideon Parchomovsky, *Tradable Patent Rights*, 60 STAN. L. REV. 863, 881–93 (2007) (proposing a new patent system that would contain a limited number of tradable patent rights); Parchomovsky & Mattioli, *supra* note 31, at 223–24 (proposing a new kind of patent right dubbed "quasi-patent" that could be asserted only against business competitors).

63. *Cf.* Heller & Hills, *supra* note 18, at 1473 (explaining the holdout problem and concluding that "[w]ith several such holdouts, negotiations collapse because the assembler, of course, cannot pay the entire surplus to each owner").

64. *Cf. id.*

65. *See, e.g.*, Fauver, *supra* note 8, at 667–68; Donna M. Gitter, *International Conflicts over Patenting Human DNA Sequences in the United States and the European Union: An Argument for Compulsory Licensing and a Fair-Use Exemption*, 76 N.Y.U. L. REV. 1623, 1679 (2001). The notion of compulsory patent licensing has long been a topic of debate in

Calabresi and Douglas Melamed's classic article, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*.[66] Likening the law to a grand cathedral that can be portrayed from many perspectives, Calabresi and Melamed presented a new vision of legal ordering that united two seemingly disparate concepts — liability and property — under the common rubric of "entitlements."[67] A property entitlement roadblock, the authors explained, can be removed by paying off the entitlement holder.[68] For example, a homeowner's entitlement to exclude trespassers can be overcome if the would-be trespasser buys the house. By contrast, liability entitlements are extinguished through the payment of fees determined ex post by some organ of the state.[69] For instance, a tortfeasor who causes a car accident can eliminate his victim's entitlement to compensation by paying court-ordered damages.

Calabresi and Melamed proposed that lawmakers could enhance the level of economic efficiency in society by wisely selecting entitlements.[70] To illustrate this idea, the authors conjured a simple anticommons scenario: a real estate developer seeking to develop one thousand adjacent parcels of land into a park that he hopes to sell to a city.[71] If the developer is willing and able to pay every landowner an above-market price, in principle the park should be built.[72] In practice, the project will fail because individual landowners can hold out for excessive prices.[73] Calabresi and Melamed explained that this inefficient result could have been avoided if a court, rather than the landowners, had the power to set prices — i.e., if the land were governed by liability rules instead of property rules.[74] This example supports the authors' normative argument that liability rules are preferable when property entitlements cannot be effectively bargained for — precisely the conditions believed to fuel the patent anticommons.[75]

---

the United States. *See, e.g.*, Frank I. Schechter, *Would Compulsory Licensing of Patents Be Unconstitutional?*, 22 VA. L. REV. 287, 288–91 (1936) (referring to debates about compulsory licensing that occurred as early as 1912).

66. *See* Calabresi & Melamed, *supra* note 7, at 1090–92.

67. *Id.* at 1089.

68. *Id.* at 1092.

69. *Id.*

70. *See id.* at 1093–94 (arguing for "the set of entitlements which would lead to that allocation of resources which could not be improved in the sense that a further change would not so improve the condition of those who gained by it that they could compensate those who lost from it and still be better off").

71. *See id.* at 1106–07.

72. *See id.* This result is consistent with frictionless Coasian bargaining. *Cf.* Coase, *supra* note 40, at 6.

73. Calabresi & Melamed, *supra* note 7, at 1106–07.

74. *Id.*

75. *See id.* ("Whenever this is the case an argument can readily be made for moving from a property rule to a liability rule."); Heller & Eisenberg, *supra* note 3, at 699–700 (explaining conditions expected to give rise to an anticommons in the biomedical research context).

Although Calabresi and Melamed's *The Cathedral* has had a profound and lasting influence on intellectual property scholarship, subsequent scholarship has tended to advocate only a partial shift to compulsory patent licensing.[76] The chief concern is that government institutions could harm innovation incentives by under-compensating patent holders.[77] To appreciate this concern, one might consider how courts value entitlements in a paradigmatic liability setting: contract breaches. As every first-year law student learns, the standard award in contract disputes is expectation damages — an amount that places non-breaching parties where they would have been had the breach never occurred.[78] When expectation damages cannot be calculated, courts sometimes award reliance damages — a remedy that restores non-breaching parties to the economic position they were in before the contract was formed.[79] Courts determine these amounts by examining evidence produced by litigants and sometimes by considering industry information such as standard market prices.[80]

---

76. Leading commentators have used *The Cathedral* as a launching point for proposing new hybrid property/liability rules. For instance, in 1977 Martin J. Adelman proposed a new liability rule that would require all patent holders to offer licenses at terms at least as good as the worst terms offered to the first two licensees. *See* Adelman, *supra* note 8, at 999–1000 (proposing the "one license rule") (internal quotation marks omitted). Writing on the subject of trade secrets in 1994, J.H. Reichman proposed a set of liability rules to govern the pricing of technical know-how. J.H. Reichman, *Legal Hybrids Between the Patent and Copyright Paradigms*, 94 COLUM. L. REV. 2432, 2548 (1994). In 2002, Abraham Bell and Gideon Parchomovsky proposed an ingenious new patent entitlement regime that combined elements of property rules and liability rules — a hybrid they dubbed "pliability rules." Bell & Parchomovsky, *supra* note 7, at 25–28.

77. *See* Gianna Julian-Arnold, *International Compulsory Licensing: The Rationales and the Reality*, 33 IDEA 349, 357 (1993) ("Anything that will interfere with the exclusive right of the owner of the patent to work it, will certainly discourage investment in this type of enterprise because of the consequent reduction in the possibility of commercial success.") (citation omitted); Robert Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 TENN. L. REV. 75, 99 (1994) ("The primary argument against compulsory licensing is that it allows courts, not the parties themselves, to set the terms of exchange."); Carol M. Nielsen & Michael R. Samardzija, *Compulsory Patent Licensing: Is It a Viable Solution in the United States?*, 13 MICH. TELECOMM. & TECH. L. REV. 509, 535 (2007) ("Our courts should not be converted into a regulatory body, setting prices, licensing terms, and other industry requirements.").

78. *See* RESTATEMENT (SECOND) OF CONTRACTS § 347 cmt. a (2013) (defining the expectation interest); E. ALLAN FARNSWORTH, CONTRACTS 730–31, 757–58 (4th ed. 2004) (explaining that the expectation interest is the ordinary basis for awards in contract disputes).

79. *See* RESTATEMENT (SECOND) OF CONTRACTS § 349 (2013) (defining reliance damages); FARNSWORTH, *supra* note 78, at 732–33, 757–58 (explaining that an injured party's reliance interest often serves as an alternate basis for contract awards).

80. Contract law disfavors property-like rules. For instance, injunctions and specific performance are only imposed with limitations. *See* FARNSWORTH, *supra* note 78, at 742–57 (explaining numerous limitations to the imposition of injunctions and specific performance as remedies in contracts disputes). Likewise, courts generally do not enforce ex ante "bargains" for the price of breach in the form of penalty clauses. *Id.* at 811 (explaining that stipulated damages are permissible when they reflect liquidated damages, but not when they serve as a penalty for breach).

It is easy to appreciate why valuing patents could be a far more complex and speculative endeavor than determining contract damages. Like contract remedies, optimal patent royalties would match the outcome of hypothetical market exchanges — i.e., entitlement holders' expectations.[81] If courts systematically awarded less than this value, innovation incentives would decrease.[82] However, unlike parties to a contract, patent applicants rarely hold well-defined expectation interests, making it difficult for a court to objectively gauge the royalties that a patent would have commanded in a voluntary exchange.[83]

Another reason that compulsory licensing is more difficult than contracting relates to changes in the market for the patented technolo-

---

81. *See, e.g.*, Daniel A. Crane, *Intellectual Liability*, 88 TEX. L. REV. 253, 271 (2009) ("[T]he owner of [an] intellectual creation would prefer to be allowed to refuse to license her creation unless the licensee agrees to pay the fee she requests.").

82. *See Compulsory Licensing of Patents: Hearing on H.R. 9259, H.R. 9815, and H.R. 1666 Before the Subcomm. on Compulsory Licensing of the H. Comm. on Patents*, 75th Cong. 38 (1938) ("[M]en do not go into the development of new things for an ordinary competitive profit. They have got to see a speculative profit in it or they will not go into it.") (statement of Thomas Ewing, former Commissioner of Patents); Ian Ayres & Eric Talley, *Solomonic Bargaining: Dividing a Legal Entitlement To Facilitate Coasean Trade*, 104 YALE L.J. 1027, 1037–38 n.40 (1995) ("Systematic under-compensation for entitlement holders under a liability rule regime would undermine the entitlement holders' incentive to create or develop the entitlement."); Richard A. Epstein, *A Clear View of the Cathedral: The Dominance of Property Rules*, 106 YALE L.J. 2091, 2093 (1997) ("The risk of undercompensation in such situations is pervasive given the inability to determine with accuracy the losses, both economic and subjective, that follow when individuals find that someone else has plucked away from them assets that they need for the operation of their own business."); Julian-Arnold, *supra* note 77, at 357 ("Absent sufficient protection, creators can no longer recover the cost of their investment in research and development, resulting in lower production, fewer trading opportunities and higher costs to the consumer.").

83. In recognition of this problem, some courts have required a high standard of proof to award lost profits in patent disputes. *See* Tektronix, Inc. v. United States, 552 F.2d 343, 348–49 (Ct. Cl. 1977) (requiring the injured party to prove its lost profits by the "strictest proof" and to prove by "clear and convincing evidence" facts relevant to the inquiry). *But see* Gargoyles, Inc. v. United States, 113 F.3d 1572, 1576 (Fed. Cir. 1997) ("Thus, the standard in private actions is that the patentee must establish, by a preponderance of evidence, that but for the infringement he would have earned the profits he asserts were lost.") (citation omitted) (internal quotation marks omitted). Basing patent royalties on research and development costs as an alternative measure of compensation is also problematic. Patents are designed to empower inventors to charge the maximum that licensees are willing to spend, rather than the cost of research and development alone. *See* Adelman, *supra* note 8, at 1007 (explaining that theoretically a patentee can "engage in perfect price discrimination by charging each customer the maximum amount that particular customer would be willing to pay"); *see also* Goodyear Tire & Rubber Co. v. Overman Cushion Tire Co., 95 F.2d 978, 984 (6th Cir. 1937) (defining a reasonable royalty in a patent infringement suit as an amount which a prospective licensee would be "willing to pay as a royalty and yet be able to make and sell the patented article, in the market, at a reasonable profit") (citing Rockwood v. Gen. Fire Extinguisher Co., 37 F.2d 62, 66 (2d Cir. 1930)). For this reason, awarding costs alone would under-compensate innovators. Moreover, there are practical difficulties in determining the "cost" of obtaining a patent. As Abraham Bell and Gideon Parchomovsky have observed, patent licenses "reflect not only the expected profits of the patentee on the current innovation, but also the expenditures incurred by the patentees in research projects that failed to yield a patentable result." Bell & Parchomovsky, *supra* note 7, at 71–72.

gy. Unlike market participants, courts or Congress could not easily adjust patent royalties over time. A chief benefit of patent ownership is the freedom to raise or lower prices in response to changes in demand and cost. For instance, if a patented genetic research method became valuable ten years after the patent's issue date, the patent's owner could recoup her initial investment by demanding higher royalties.[84] Because it would not be feasible for government institutions to replicate this dynamism, compulsory patent licensing necessarily denies inventors their full monopoly return.

Empirical evidence supports the argument that inventors would be under-compensated in a compulsory licensing regime: In practice, courts often under-compensate patent holders for damages caused by past infringement.[85] Experiments designed to evaluate compulsory patent licensing have concluded "that although a scheme including compulsory licensing and rate regulation would lower some prices, it would also result in less market security, significantly less research in some fields, less public disclosure and transfer of technology, and increased administrative costs."[86]

In sum, both bargaining and liability regimes engender pricing problems that hinder innovation. In our current bargaining regime, innovation is hindered by high transaction costs and the risk of holdouts due to the near-absolute power that patent holders have to set

---

84. *See* Adelman, *supra* note 8, at 999 ("It may be quite appropriate for the patentee to obtain a higher royalty from the second patentee owing, for example, to changes in demand and cost conditions since the first license was granted or to a desire to capture the benefits of one licensee's more efficient production methods.").

85. *See, e.g.*, Panduit Corp. v. Stahlin Bros. Fibre Works, 575 F.2d 1152, 1158 (1978) ("The setting of a reasonable royalty after infringement cannot be treated . . . as the equivalent of ordinary royalty negotiations among truly 'willing' patent owners and licensees. That view would . . . make an election to infringe a handy means for competitors to impose a 'compulsory license' . . . ."); *see also* Fauver, *supra* note 8, at 667 n.9 ("When a government grants a compulsory license, the courts will ordinarily prescribe a royalty rate which would be less favorable to the patentee.").

86. *See* Adelman, *supra* note 8, at 986 n.35 (citing CHRISTOPHER THOMAS TAYLOR & Z. SILBERSTON, THE ECONOMIC IMPACT OF THE PATENT SYSTEM 349–50 (1973)). It should be noted, however, that compulsory patent licensing may be helpful in settings unrelated to anticommons problems. *See generally* Fauver, *supra* note 8, at 685 (arguing in favor of a compulsory patent licensing plan). In 1982, the economist Pankaj Tandon proposed that compulsory patent licensing could enhance social welfare in some settings, although he noted that this conclusion relied upon simplified assumptions. Pankaj Tandon, *Optimal Patents with Compulsory Licensing*, 90 J. POL. ECON. 470, 483–84 (1982). *Cf.* Merges, *supra* note 77, at 99 ("Although Scherer has shown that compulsory licensing has not on the whole been deleterious when applied as part of an antitrust remedy, he is also careful to limit his support to this context only."). Ian Ayres and Eric Talley have persuasively argued that the very existence of compulsory licensing rules can encourage patent holders to bargain privately. *See* Ayres & Talley, *supra* note 82, at 1094 ("Indeed, the inability of a court to tailor a damages award and the existence of litigation costs can often improve the ability of the parties to reach a consensual, efficient agreement on their own terms, not those dictated by the underlying liability rule."). Although liability rules might facilitate bargains in small concentrated settings, they have not been shown to encourage broader systemic forms of collective action of the kind believed to affect the process of innovation.

licensing fees. By contrast, a liability regime could hinder innovation through systematic under-compensation — seemingly an unavoidable risk if patent holders are to be denied any control over the royalties they collect. However, there may be a middle road in which bargaining failures are averted, and in which inventors can influence the royalties they collect: collective patent valuation.

C. The Theory of Collective Patent Valuation

Property holders can, and often do, take steps to remedy property-pricing problems by forming private collective rights organizations. From condominium associations to agricultural collectives to musical copyright licensing groups, the design of such groups varies widely in practice. However, all operate on a simple principle: They permit property owners to draw value from what they own through systems of collective decision-making. Most commonly, this entails voting over key decisions that influence the distribution of wealth.[87] Such voting systems give individual property holders a degree of control over their profits that they would not otherwise enjoy under a compulsory licensing system. Thus, if patent pools truly promote innovation investments, one would expect them to follow a similar template.

Some of the best-documented episodes of collective property valuation appear in the studies of Elinor Ostrom.[88] A pioneer of the new institutional economics, Ostrom examined how self-governed communities preserve scarce natural resources.[89] This inquiry led Ostrom to visit resource-sharing communities around the globe — from remote Japanese villages to Swiss mountain towns.[90] Across such diverse settings, Ostrom identified a unifying theme: In one form or another, collective choice arrangements were almost always a basis for ongoing cooperation and efficient distribution of wealth and property in long-enduring collectives.[91]

In one case study, Ostrom reported on an agricultural commune in Alicante, Spain that relied on voting to manage the use of water.[92] For centuries, the individual owners of water rights in the region had pooled their collective rights into a syndicate.[93] The Alicante irrigation syndicate leased these aggregated water rights out to small land-

87. *See generally* Yoram Barzel & Tim R. Sass, *The Allocation of Resources by Voting*, 105 Q. J. ECON. 745 (1990) (presenting a general economic theory of voting in the context of owners' associations of newly developed condominiums).

88. *See, e.g.*, OSTROM, *supra* note 17.

89. *See id.* at 182–83 (suggesting that the tragedy of the commons does not always accurately describe how communities work in practice).

90. *See generally id.*

91. *See id.* at 90, 93 (identifying "collective-choice arrangements" as a fundamental design principle reflected in long-enduring collectives).

92. *See id.* at 78–80.

93. *See id.* at 79–80.

owners.[94] Members of the syndicate met regularly to vote over profit sharing and decisions related to securing contracts with outside water suppliers.[95] The group allocated one vote to each individual, rather than weighting votes based on, for instance, the size of property holdings.[96] Echoing the words of an earlier historian, Ostrom attributed the strength and stability of the Alicante irrigation syndicate to its "democratic and representative character."[97]

Commentators have similarly documented the use of collective valuation procedures to govern the use of real estate. For example, empirical studies have revealed that voting is the basis for nearly all decision-making within condominiums.[98] In an article exploring the condominium model, Michael Heller and Rick Hills argued that private voting is an optimal means of managing property rights because it allows property owners, rather than government authorities, to set prices.[99] Experimental studies conducted by scholars in the field of public choice substantiate this assertion.[100]

Public laws also draw on the power of democratic self-governance to manage property rights.[101] In a 2010 publication, Thomas Merrill reported on how home owners in New Haven, Connecticut voted over the question of whether to create a neighborhood historic preservation district.[102] This measure promised to increase the value of individual homes, but threatened to limit owner autonomy by restricting the exterior modifications that could be made to homes.[103] A Connecticut state law called for the decision to be voted on under "one-owner, one-vote" rules similar to those used by the Alicante irrigation syndicate.[104] The community ultimately decided against creating the district — a decision that Merrill believed was more legitimate

94. *See id.* at 78–79.

95. *See id.* at 80.

96. *Id.*

97. *Id.* at 81 (citations omitted) (internal quotation marks omitted).

98. *See* Barzel & Sass, *supra* note 87, at 760 (stating that condominium developers are legally bound to "specify the allocation of votes and assessments among condominium unit owners"); *see also id.* at 748 ("By internalizing exchange, such voting organizations avoid certain transaction costs that would be incurred with market exchange.").

99. *See* Heller & Hills, *supra* note 18, at 1470 ("Unlike eminent domain, the residents controlling [a land assembly district] would have a veto over whether or not to proceed with land assembly: if the municipality or developer does not offer a price satisfactory to the [land assembly district's] constituents, then the assembly of land would not go forward.").

100. *See generally* James M. Walker et al., *Collective Choice in the Commons: Experimental Results on Proposed Allocation Rules and Votes*, 110 ECON. J. 212 (2000).

101. *See, e.g.*, 7 U.S.C. § 291 (2012) (setting forth special voting rules to be used within agricultural collectives); 12 U.S.C. § 1760 (2012) (setting forth voting rules to be used within federal credit unions).

102. Merrill, *supra* note 18, at 276.

103. *Id.* at 287.

104. *Id.* at 275; *see also id.* at 288 ("Each owner of property having an assessed property tax valuation of at least $1000 on which property taxes were paid in the previous year is entitled to one vote.").

and informed than one that local government officials could have come to on their own.[105]

Robert Merges has documented the use of collective decision-making in the American Society of Composers, Authors, and Publishers ("ASCAP").[106] ASCAP licenses its members' copyrighted musical works to outsiders in exchange for royalties which it distributes back to its members through a pro rata formula.[107] As Merges explained, members of ASCAP vote over major decisions, including the election of a "Classification Committee" that determines the royalties members receive.[108] Unlike the "one-owner, one-vote" rule used in the examples already discussed, ASCAP apportions voting power based on the number of times a member's musical work is licensed.[109] Merges reported that although some members have argued that this weighted voting system is undemocratic, most members appear to be pleased with how royalties are distributed.[110]

Such empirical studies have inspired a vast body of theoretical literature on the virtues of voting over property. Public choice experts have observed that voting encourages deliberation and communication between rights holders, allowing property to be governed by the "wisdom of crowds."[111] Economic theorists believe that voting systems promote economic efficiency by allowing property holders to draw the maximum possible value from their individual assets.[112] Property theorists have opined that, unlike liability regimes, voting regimes allow those with the greatest familiarity and knowledge of a marketplace — owners — to set prices optimally.[113] Luminaries from the

105. *Id.* at 293 (opining that, by restricting voting to property owners, the community assured a "well-informed and motivated electorate"); *see also id.* at 310.

106. *See* Merges, *supra* note 11, at 1328–40 (discussing the history and internal governance of ASCAP).

107. *See id.* at 1329 (explaining that ASCAP "monitors the songs played and divides up the total receipts among all members on the basis of a complex *pro rata* formula").

108. *Id.* at 1339 (discussing the activities of ASCAP's Classification Committee).

109. *See id.* at 1339 n.152 (explaining the details of the formula).

110. *See id.* at 1338, 1338 n.145.

111. *See* Matthew C. Stephenson, *Information Acquisition and Institutional Design*, 124 HARV. L. REV. 1462–63 (2011) (explaining the popular notion of the "wisdom of crowds"); Walker et al., *supra* note 100, at 231 (concluding that "voting substantially increases the efficiency of the outcomes achieved" through collective decision-making in the context of common resource-sharing communities, and moreover, that "[t]he very act of making a proposal and voting on a set of proposals . . . appears to generate information that enables a learning process to occur").

112. *See generally, e.g.*, WILLIAM A. FISCHEL, THE HOMEVOTER HYPOTHESIS: HOW HOME VALUES INFLUENCE LOCAL GOVERNMENT TAXATION, SCHOOL FINANCE, AND LAND-USE POLICIES (2001) (arguing that homeowners seeking to maximize the value of their homes will vote in local elections).

113. *See, e.g.*, David Arthur Skeel, Jr., *The Nature and Effect of Corporate Voting in Chapter 11 Reorganization Cases*, 78 VA. L. REV. 461, 479 (1992).

new institutionalist school likewise argue that voting systems lead to efficient resource allocations.[114]

These observations support the alluring theory that patent holders *can be expected* to form private regimes that act as forums for collective valuation, reducing transaction costs and holdout risks while incentivizing innovation. The roots of this theory appear in a 1990 economics paper written by Yoram Barzel and Tim R. Sass in which the authors predicted that voting regimes would emerge to allocate resources among multiple property holders.[115] Several years later, Robert Merges posited that patent licensing institutions governed by voting rules "tend to emerge" in order to overcome bargaining problems.[116] Merges drew empirical support from the structure of two patent pools: a 1916 patent pool relating to folding beds and a 1917 patent pool relating to aircraft.[117] Merges' optimistic view is reinforced by the fact that antitrust authorities review the structure of patent pools in order to ensure they do not harm competition.[118]

If private patent holders tend to preserve innovation even as they cooperate, then perhaps the proper focus of patent reform need not be on the government's apportionment or valuation of patents, but rather on fostering and monitoring private licensing collectives. In other words, perhaps the patent system does not need to be "fixed" after all.

The Theory of Collective Patent Valuation demands empirical study. Existing empirical literature on patent pools, while immensely valuable, has not explored the interaction between governance and innovation.[119] For example, economists Anne Layne-Farrar and Joshua Lerner examined rent-sharing formulas in modern standard-setting patent pools, but their work did not explicitly address how the governance of those pools related to innovation incentives.[120] The dearth of scholarship on this subject is due in part to the fact that the contracts that bind such organizations are not widely available. In fact, the only historical account of voting within patent pools appears in Robert Merges' 1996 publication on collective rights groups.[121] Thus, the possibility that private collectives will arise to cure our ailing pa-

---

114. *See, e.g.*, Walker et al., *supra* note 100, at 231 ("[V]oting substantially increases the efficiency of the [experimental] outcomes achieved.").

115. *See generally* Barzel & Sass, *supra* note 87.

116. Merges, *supra* note 11, at 1392 ("Firms work together to establish a collective price charged to licensees for use of the members' [intellectual property rights]. . . . Where firms are involved in such transactions repeatedly, institutions . . . tend to emerge.").

117. *Id.* at 1343–50.

118. *See Antitrust Guidelines for the Licensing of Intellectual Property*, U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N (Apr. 6, 1995), *available at* http://www.justice.gov/atr/public/guidelines/0558.htm#t55.

119. *See supra* note 1 (highlighting empirical scholarship related to patent pools).

120. *See generally* Layne-Farrar & Lerner, *supra* note 1.

121. *See generally supra* note 1 and accompanying text; Merges, *supra* note 11.

tent system enjoys theoretical support,[122] but lacks empirical grounding.

III. A STUDY OF COLLECTIVE GOVERNANCE

Can we expect patent holders to privately remedy the pricing problems that threaten innovation? This question hinges on how patent pools are governed — a topic that has not yet been explored by legal scholars. In search of answers, this Part presents an original study of fifty-two patent licensing agreements in operation between 1856 and 2013. These contracts show that many patent pools place the power to apportion royalties exclusively in the hands of their founders. Newcomers, when they are permitted to join these groups, rarely have control over the royalties they draw. As a result, most patent pools do not support the Theory of Collective Patent Valuation. However, some such institutions may still be capable of encouraging innovation through "rough-and-ready" rent-sharing rules that benefit repeat players.

Because there is no single historical record of all patent pools, the information described here is drawn from numerous sources, including exhibits to antitrust lawsuits housed in regional repositories of the National Archives, records of congressional investigations on patent pooling, FOIA requests directed to the Antitrust Division of the DOJ, the Wisconsin State Historical Society, the New York State Library in Albany, the files of academic historians, and in some instances, patent licensing organizations themselves. This study also draws on interviews with attorneys and executives directly involved in present-day licensing groups.

This study is as comprehensive as possible in light of available historical records. It is likely, however, that some groups of patent holders did not preserve records of their cooperation; others may have relied on oral agreements or tacit understandings that left no trace. As a result, there is a possibility of sampling bias. While this possibility should not be ignored, its significance should also not be overestimated. The set of episodes described herein may be incomplete but nonetheless unbiased, or biased in a way that only downplays this study's chief conclusions — i.e., the design of undocumented patent pools may be similar to the pools described herein.

The dates on which these groups formed are revealing. As the list in the Appendix shows, collective patent licensing in the United States reached a peak during the 1930s and then precipitously dropped off until the late 1990s.[123] One possible explanation for this pattern is the

122. *See supra* notes 111–18 and accompanying text.
123. *See infra* Appendix.

loosening and subsequent tightening of antitrust scrutiny during the early-to-mid twentieth century.[124] The recent resurgence in collective licensing, which began in the late 1990s, appears to have been primarily motivated by the development and widespread use of digital communications and media standards.[125] As of this writing, the upswing is continuing and has reached beyond such technological standards to pharmaceuticals and environmentally sustainable technologies.[126]

A. Ex Ante Bargains

Of the fifty-two patent licensing groups in this study, twenty were not designed to apportion royalties to new patents.[127] Instead, these organizations carried out ex ante bargains related to products or methods in existence at the time of agreement. All such bargains delivered fixed royalties to their founders, as measured either in dollar amounts for every machine built by licensees, or by percentages of total incoming royalties. The static nature of these cooperatives obviated any need for elaborate systems of collective patent valuation. Future technologies were rarely contemplated in these agreements, let alone promoted by them. The following descriptions of three such groups — The Singer Combination, the Consolidated Seeded Raisin Company, and the Indiana Manufacturing Company — offer important insights into the more complex arrangements described later in this Part.

The Singer Combination, as it was called, was America's first patent pool and is exemplary of the ex ante licensing structure.[128] The Singer Combination was formed in 1856 by three of the largest sewing machine manufacturers in the United States: the Wheeler & Wilson Manufacturing Company, the Grover & Baker Sewing Machine Company, and I. M. Singer & Company.[129] At an October meeting in Albany, the chiefs of all three companies contracted into a byzantine

---

124. *See generally* Richard J. Gilbert, *Antitrust for Patent Pools: A Century of Policy Evolution*, 2004 STAN. TECH. L. REV. 3 (2004).

125. *See infra* Appendix.

126. *See id.*

127. Fixed-sum organizations related to the following subject matter: sewing machines (1856), pneumatic straw stackers (1895), bathtubs (1899), and bicycle and motorcycle brakes (1913). *See id.* Fixed-percentage organizations related to the following subject matter: steel-making (1866), seeded raisins (1900), liquid door checks (1909), beds (1916), automobile bumpers (1916), oil refining (1921), flat glass (1924), rail joint bars (1931), oil refining (1933), hydraulic oil pumps (1933), variable condensers (1934), plexigum (1935), pour depressants (1938), fuse cutouts (1938), furniture slipcovers (1938), and elastic stockings (1949). *See id.*

128. *See generally* Adam Mossoff, *The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s*, 53 ARIZ. L. REV. 165 (2011) (chronicling the history of the Singer Combination).

129. Agreement between Elias Howe, Jr., the Wheeler & Wilson Mfg. Co., the Grover & Baker Sewing Machine Co., and I. M. Singer & Co. (Oct. 24, 1856) (on file with author) [hereinafter Singer Agreement].

web of cross-licenses and commitments wherein each member received permission from the others to manufacture a limited number of sewing machines of various types each year.[130] The price to be charged to consumers for each machine was dictated in the Singer Agreement, as were the royalties that each member would receive from outside manufacturers:

> In case of any future license to other parties under the patents enumerated in the two last preceding sections, and owned by the parties hereto, the license fee shall be fifteen dollars for each machine for the right under all of the said patents . . . and shall be shared by the said parties as follows, viz: five dollars to said Howe, five dollars to I. M. Singer & Company, and five dollars to the Grover & Baker Sewing Machine Company, and Wheeler & Wilson Manufacturing Company . . . .[131]

Because the founding members of the Singer Combination were sewing machine manufacturers as well as patent holders, the Singer Agreement also dictated the amounts that each member would pay the others for every machine they built and sold.[132] Because these sums were laid out in the agreement, it is clear that they were based entirely on ex ante bargaining. For instance, the Grover & Baker Sewing Machine Company promised to pay I. M. Singer & Company five dollars for every machine it manufactured in excess of an agreed upon number.[133] The Singer Agreement allocated no royalties for new (i.e., after-acquired) patent rights.[134]

Some patent pools divided royalties to members based on percentages rather than fixed sums.[135] The United States Consolidated Seeded Raisin Company, a California-based patent licensing collective formed in 1900, is representative of this design:[136] The organization's founding members included four corporations and four individuals, each of whom owned patents on machinery and processes for raisin seeding.[137] These eight founders assigned their patents to a new corporation — the United States Consolidated Seeded Raisin

130. *See id.*
131. *Id.*
132. *See id.*
133. *See id.*
134. *See generally id.*
135. *See supra* note 127.
136. *See* Agreement between the U.S. Consol. Seeded Raisin Co., the Forsyth Raisin Process Co., the Forsyth Seeded Raisin Co., the Griffin & Skelly Co., the Cal. Seeding Machine Co., William M. Griffin, Thomas E. Langley, Cary S. Cox, and Lee L. Gray (June 26, 1900) (on file with author) [hereinafter Seeded Raisin Agreement].
137. *See id.*

Company — which was formed specifically to administer patent licensing and royalty sharing.[138] The agreement entered into by all members divided incoming royalties into five fixed percentages.[139] Tellingly, the contract recited the percentages that specific patents "earned," indicating that the group did not contemplate the inclusion of new patents or new members:

> The royalties which shall be received upon license contracts issued under and by virtue of this agreement shall . . . [be] distributed and paid over as follows: *40 per cent*. to said United States Consolidated Seeded Raisin Company on account of said Letters Patent, No. 543833 and 543834; *30 per cent*. to said Forsyth Raisin Process Company, its successors and assigns, on account of said Letters Patent 611782; *20 per cent*. to the present owners of said Letters Patent 619698; *6 per cent*. to Thomas E. Langley and Cary S. Cox, their legal representatives and assigns, on account of said Letters Patent 641938 and 641939; and *4 per cent*. to said California Seeding Machine Company, its successors and assigns, on account of said Letters Patent No. 614178; and said pending application for Letters Patent, Serial No. 679223.[140]

Interestingly, the Seeded Raisin Agreement stipulated that royalty distributions between the group's founders would shift proportionally as individual patents were declared invalid by a court.[141] This provision adds a degree of dynamism to the United States Consolidated Seeded Raisin Company's royalty-sharing arrangement, but not the kind that would encourage innovation: It shifted royalties only in response to the invalidation of existing patent rights, but did not direct royalties to new patent rights.

In contrast to the Seeded Raisin and Singer Agreements, one patent pool based on ex ante bargaining did appear to contemplate future technologies: The Indiana Manufacturing Company ("IMC"), a corporation formed in 1895, acted as a clearinghouse for patent rights related to agricultural machinery.[142] In an agreement that accompanied its standard patent license to manufacturers, the IMC sought licensees' promises to "endeavor to improve upon Pneumatic Stackers," and to

---

138. *See id.*

139. *See id.*

140. *Id.* (emphases added).

141. *Id.* ("[I]n case any of the above mentioned letters patent shall be judicially determined to be invalid . . . the share of royalties hereinbefore apportioned to and on account of such letters patent, shall hereafter not be paid . . . .").

142. *See* Form Agreement issued by the IMC (1914) (on file with author).

convey to the corporation all future patent rights that covered such improvements.[143] In exchange for these promises, the IMC promised to pay licensees five dollars for each pneumatic stacker manufactured under its licenses.[144] Although this provision was forward looking, it dictated a fixed amount for any and all new patent rights rather than a procedure for collective valuation. In this respect, the provision placed inventors in essentially the same position they would find themselves in a compulsory licensing regime — entirely subject to valuations performed by an institution.[145]

The above three agreements, along with a substantial proportion of documented patent pools, were not structured to act as forums for patent valuation and, therefore, do not bear out the predictions of the Theory of Collective Patent Valuation. Because these arrangements generally related only to patents in existence at the time of agreement, they had no need for procedures to determine the royalties that new patents would earn. There were simply not many ongoing decisions for these short-term oriented groups to make.

B. Corporate Dividends

Corporate issuance of dividends is a second mechanism that has been adopted to apportion royalties within patent pools.[146] Fifteen patent pools identified in this study were corporations that acquired full ownership of patents held by their members in exchange for stock that periodically yielded dividends.[147] Unlike the ex ante bargains described in the foregoing Part, these share-based groups were capable of directing a portion of their profits to the contributors of after-acquired patent rights. However, the decisions that governed the royalties that such patents earned — e.g., the amount of stock to be offered to an inventor in exchange for a patent, the amount of a given dividend distribution, the timing of dividend distributions — were made by officers of these organizations, and not by shareholders. As a

---

143. *Id.*

144. *Id.*

145. The company was named as an assignee in just six patents issued after the date of the group's formation in 1895. U.S. Patent No. 997,936 (filed Oct. 13, 1910); U.S. Patent No. 1,028,793 (filed Apr. 29, 1910); U.S. Patent No. 902,841 (filed Apr. 13, 1908); U.S. Patent No. 821,584 (filed Aug. 15, 1904); U.S. Patent No. 722,369 (filed Apr. 14, 1902); U.S. Patent No. 566,491 (filed Jan. 14, 1896). This small number of additional patents suggests that the group's valuation system failed to encourage patenting.

146. Share-based organizations related to the following subject matter: fiberglass (1956), women's hosiery (1955), wrinkle finishes (1952), air conditioning (1943), petroleum refining (1935), lecithin production (1934), machine tools (1933), water conditioning (1930), coated abrasives (1929), peach pitting (1926), radio (1919), footwear (1899), farming tools (1890), and steel-making (1877, 1890). *See infra* Appendix.

147. *See id.* Although many patent pools discussed in this paper were incorporated, only the pools described in this Part relied exclusively on the issuance of dividends as the mechanism for profit sharing.

result, these share-based groups were not truly platforms or forums for *collective* patent valuation.

The Pneumatic Steel Corporation, a steel patent licensing group formed in the late-nineteenth century, illustrates the share-based design.[148] The group was born from a dispute: In the late 1850s, two American investor groups acquired patent rights to the "Bessemer process" — a breakthrough in steelmaking technology.[149] One group of investors held patents developed by Sir Henry Bessemer, the original inventor of the process.[150] A second group held a blocking patent derived from experiments with related processes.[151]

Faced with this legal impasse, the two steelmaking concerns consolidated their patent rights — initially under a trust and later through a corporation.[152] The Pneumatic Steel Corporation, as it was named, granted the various patent holders and their beneficiaries dividend-yielding stock in return for their assignment of patent rights.[153] Ten thousand shares were distributed in total.[154] These shares were distributed between the Kelley Process Company and the Albany investors based on the numerical ratio of patents that each group contributed.[155] Private correspondence between the group and one shareholder shows that dividends were distributed several times each year.[156]

---

148. *See* THOMAS J. MISA, A NATION OF STEEL 19–21 (2d ed. 1999) (describing the dispute that gave rise to the consolidation of Bessemer patents).

149. *Id.* at 17–19.

150. *Id.* at 19.

151. *See id.* at 19–20.

152. *Id.* at 20*; see also* The Bulletin of the American Iron and Steel Association (Oct. 27, 1869) (advertisement) (on file with author) (identifying the trusteeship titled "THE TRUSTEES OF THE PNEUMATIC OR BESSEMER PROCESS OF MAKING IRON AND STEEL"); The Pneumatic or Bessemer Process of Making Iron and Steel (1865) (brochure) (on file with author) (describing the trusteeship of which Z. S. Durfee of Philadelphia was the general agent). Evidence of the corporation, which was titled "The Pneumatic Steel Association," appears in correspondence received by the beneficiaries of John A. Griswold, who was an original shareholder. Letters from Z. S. Durfee of The Pneumatic Steel Ass'n to the Ex'rs of the Late John A. Griswold (1873–74) (on file with author) [hereinafter Griswold Letters].

153. *See* Griswold Letters, *supra* note 152.

154. *See id.*

155. The Bessemer Association first took form in 1866. *See* MISA, *supra* note 148 at 19–20. At that time, the Kelley/Ward group had been granted three patents. *See* Anthony William Deller, *Social and Economic Impact of Patents*, 46 J. PAT. OFF. SOC'Y 424, 434 (1964) (stating that William Kelly was granted U.S. Patent Nos. 16,444, 17,628, and 18,910). The Troy investors held seven patents at the time the association took form. *See id.* (listing two Bessemer patents); Articles of Ass'n of the Bessemer Steel Co. Ltd. (Mar. 1, 1877) (on file with the author) (listing an additional five Bessemer patents). The Troy investors received seventy percent and the Kelley/Ward group received thirty percent. *See* Thomas J. Misa, *Controversy and Closure in Technological Change: Constructing "Steel," in* SHAPING TECHNOLOGY / BUILDING SOCIETY: STUDIES IN SOCIOTECHNICAL CHANGE 109, 123 (Wiebe E. Bijker & John Law eds., 1st ed. 1992).

156. *See* Griswold Letters, *supra* note 152.

It appears that the Pneumatic Steel Corporation either did not admit or, alternatively, did not attract outside patent holders: When the corporation was restructured as the Bessemer Steel Company in 1877,[157] the new corporation's articles of association listed only the patents originally held by the organization along with six after-acquired patents developed by the founding members.[158] This shows that, during its eleven years in operation, the Pneumatic Steel Corporation acquired no patents developed by outside inventors.

In addition to limiting the decision-making power of shareholders, some share-based patent pools limited the transferability of stock.[159] For example, a 1926 corporation that acquired patents on machinery and methods of removing the pits from peaches granted each of its two founders 2500 shares of common stock valued at $100 each.[160] A provision in the pooling agreement limited the availability of stock to potential newcomers:

> The parties hereto agree that before either of them may sell or otherwise dispose of the whole or any portion of the capital stock of the Corporation, and in the event a bona fide purchaser shall be obtained therefor, the party so wishing to sell or otherwise dispose of such stock shall give written notice to the other party advising it of the terms of sale or disposition, and the party to whom such notice is given shall have fifteen (15) days after the giving of such notice within which to elect to purchase or acquire the stock so being offered for sale upon the same terms and conditions upon which the bona fide purchaser is willing to purchase or acquire said stock, and should such party elect to so purchase or acquire such stock, it shall have the right to so purchase or acquire the same on demand.[161]

This limitation is consistent with the theme that united all fifteen share-based pools examined in this study: Despite being capable of inducing innovation by, for instance, making stock available to inno-

157. *See* Articles of Ass'n of the Bessemer Steel Co. Ltd. (Mar. 1, 1877) (on file with author).

158. The Bessemer Patents were U.S. Patent Nos. 49,051, 49,052, 49,053, 49,054, 49,055, and 117,968; the Kelly Patent was U.S. Patent No. 17,628 (Reissue 505); the Holley Patents were U.S. Patent Nos. 86,303 and 106,162; and, the Fritz Patent was U.S. Patent No. 133,771. *Id.*

159. Five of the fifteen corporate patent pools identified in this study limited the transferability of stock.

160. Agreement between Cal. Packing Corp. and Anderson-Barngrover Mfg. Co. (Jun. 22, 1926) (on file with author).

161. *Id.* at 3–4.

vators, such groups tended to concentrate patent ownership. Because these share-based pools did not give their members a meaningful voice in valuation decisions, and because they rarely included new members over time, they do not support the Theory of Collective Patent Valuation.

C. Rough-and-Ready Formulas

In contrast to ex ante bargains and corporate decision-makers, profit sharing in most patent pools today is governed by individual evaluators whose authority is limited by profit sharing formulas. This system is less complicated than it may sound: Evaluators decide whether a new patent will be included within a given pool, and then profit-sharing formulas dictate the royalties the patent's contributor will receive. Of the fifty-two organizations analyzed in this study, six fit this design; all six related to technological standards, such as the MPEG video format, and the RFID and 3G wireless data protocols.[162] As the following examples illustrate, these groups favor "rough-and-ready" cooperation over democratic systems of collective valuation.[163]

The MPEG-2 patent pool, which governs patents related to a variety of digital video technologies, demonstrates how formula-based royalty sharing works. The group was formed in 1997 by Fujitsu, Mitsubishi, Philips, Sony, and several other companies that held patent rights related to the underlying technology.[164] Today, the group's membership has expanded to over twenty patent holders.[165] The MPEG-2 patent pool allocates royalties to its members according to pro rata rules as follows:

> (P/N) x M, where P is the number of the Party's MPEG-2 Patent Portfolio Patent(s) in the country, N

---

162. Formula-based licensing organizations related to the following subject matter: RFID wireless data transport (2008), H.264 digital video (2004), 3G mobile communications (2001), IEEE 1394 "Firewire" data transport (1999), Digital Video Disc storage (1998), and MPEG-2 video (1997). *See infra* Appendix.

163. The practice of shifting royalties over time first appeared in the 1930s. For instance, in a 1933 patent pool relating to a petroleum refining process, a complex graded-valuation formula was designed to lower the percentage of royalties that one patent holder would receive for the first five years following the agreement. *See* Agreement Between Standard Oil Co. (N.J.), Standard Oil Dev. Co., Union Oil Co. (Cal.), Standard Oil Co. (Ind.), and The M. W. Kellogg Co. (Oct. 27, 1933) (on file with author) [hereinafter HC Technique Agreement].

164. *See* Letter from Garrard R. Beeney, Sullivan & Cromwell, to Joel I. Klein, Acting Assistant Attorney Gen., Antitrust Div. of the U.S. Dep't of Justice (Apr. 28, 1997) (on file with author) (detailing the development of the MPEG-2 standard) [hereinafter MPEG-2 Letter]; Seth Goldstein, *Consolidation of DVD Royalties Collection is Goal of MPEG LA*, BILLBOARD, http://iviewit.tv/CompanyDocs/Copy%20of%20MPEG%20Articles/1997%2008%2007.pdf (last visited May 7, 2014) (Lucent was not an original member of MPEG LA).

165. *MPEG-2 Licensors*, MPEG LA, http://www.mpegla.com/main/programs/M2/Pages/Licensors.aspx (last visited May 7, 2014).

> is the total number of MPEG-2 Patent Portfolio Patent(s) in that country included in the MPEG-2 Patent Portfolio, and M is the total royalties considered paid on MPEG Patent Portfolio Patent(s) in that country . . . .[166]

Thus, Sony, who as of this writing contributed 218 out of the MPEG-2 group's 494 total patents, is currently allocated forty-four percent of all royalties.[167]

By valuing all patents equally, the MPEG pool's pro rata formula makes fine-grained patent valuations impossible. For instance, a new and valuable patent that required years of costly research would draw the same amount of royalties as a less valuable patent. As some commentators have observed, such formulas may create perverse incentives for members to simply file high numbers of patent applications and to claim that many patents are "essential."[168]

Some standards-based patent pools have adopted more complex formulas to discourage such behavior. For instance, the RFID patent pool alters the pro rata formula such that "half of the royalties are allocated to participants based on the number of patents contributed by each participant, and the other half are allocated substantially equally among participants."[169] By hinging fifty percent of all royalties on the pure *number of members* within the group rather than the *number of patents* within the group, this hybrid approach could limit strategic patenting behavior. However, this formula arguably results in an even cruder division of royalties than a purely pro rata formula.[170]

A second type of formula adopted by some groups gradually apportions fewer royalties to patents over time. The DVD patent pool, for instance, allocates royalties to patent holders on the basis of how old their patents are.[171] According to the group's organizers, this for-

---

166. Agreement between the Trs. of Columbia Univ., Fujitsu Ltd., Gen. Instrument Corp., Lucent Technologies Inc., Matsushita, Mitsubishi, Philips Electronics N.V., U.S. Philips Corp., Scientific-Atlanta, Inc., and Sony Corp. (1996) (on file with author) [hereinafter MPEG-2 Agreement].

167. *Compare id.*, *with MPEG-2 Attachment 1*, MPEG LA, http://www.mpegla.com/main/programs/m2/Documents/m2-att1.pdf (last visited May 7, 2014) (listing all MPEG-2 patents as of the last visited date, including those patents contributed by Sony Corporation). The aforementioned list will have changed by the publication date of this Article.

168. *See, e.g.*, Layne-Farrar & Lerner, *supra* note 1, at 296 ("This maintains some stability in royalty shares over time, with all adjustments made at the time of license renewal, but does not eliminate the perverse incentive to patent aggressively.").

169. Letter from Thomas O. Barnett, Assistant Attorney Gen., Antitrust Div. of the Dep't of Justice, to William F. Dolan and Geoffrey Oliver, Jones Day (Oct. 21, 2008) (on file with author) [hereinafter RFID Letter].

170. This conclusion is based on the assumption that the value of an individual patent within a licensing group is more closely a product of the total number of patents within the group than the total number of members.

171. *See* Letter from Carey R. Ramos, Paul, Weiss, Rifkind, Wharton & Garrison, to Joel I. Klein, Assistant Attorney Gen., Antitrust Div. of the Dep't of Justice (Oct. 9, 1998),

mula was selected to encourage contributors to license new and valuable patent rights to the collective.[172] This approach seems to assume that older patents are always less valuable than newer ones. As such, graded royalty sharing, like pro rata distributions, appears as a rough-and-ready approximation of patent value.

All formula-based groups charge a single decision-maker with the task of determining whether or not to include a new patent in the mix. As a result, the only way that a prospective innovator could influence his profits in a formula-based regime is by helping to define the standard around which a patent pool is organized. The MPEG-2 patent pool provides a helpful example of how this can be done. Between 1988 and 1994, the MPEG-2 standard was drafted and defined by an open working group of engineers and experts from over one hundred technology companies. Collaboration was coordinated by a standard-setting entity called "ISO/IEC."[173]

Once the first draft of the MPEG-2 standard was defined, several members agreed to allow two outside experts to identify patents that were "essential" to the technology.[174] Entities that held one or more essential patents included many participants in the standard-setting group, including Columbia University, Fujitsu, General Instrument, Matsushita, Mitsubishi, Philips, Scientific-Atlanta, and Sony.[175] These founding organizations agreed to a pro rata royalty division formula,[176] and formed an independent limited liability company called "MPEG LA" to administer licensing and royalty collections.[177] In this way, only organizations that participated in the standard-setting process for MPEG LA had opportunities to have their patented technologies incorporated into the final standard, and consequently, into the patent pool.[178]

Although formula-based patent pools do not value individual patents carefully, their lack of precision may be compensated for over

---

available at http://www.justice.gov/atr/public/busreview/request-letters/302365.pdf (discussing the impartial expert valuation of those patents in the pool after the first two year, then every four years, in order to determine the fraction of royalties to be granted to that patent) [hereinafter DVD Letter].

172. *Id.*

173. MPEG-2 Letter, *supra* note 164.

174. *Id.* at 11 ("Under Dr. Rubenstein's direction, and with the assistance of Cliff Reader, Ph.D [sic] . . . approximately 8,000 United States patent abstracts were reviewed . . . . [T]he essential patent holders believe that the proposed licensing arrangement includes most, but not all, MPEG-2 essential patents.").

175. *See id.* at 2 n.1; *see also* Goldstein, *supra* note 164 (stating that Lucent decided not to join the organization).

176. *See* MPEG-2 Agreement, *supra* note 166, at 14–15 (explaining the royalty division formula).

177. MPEG-2 Letter, *supra* note 164.

178. *See generally, e.g.*, Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 CAL. L. REV. 1889 (2002) (describing the processes used by standard-setting organizations).

time: For instance, a formula that over-values roughly the same number of patents as it under-values could still satisfactorily value collections of patents in the aggregate. This possibility, combined with the open membership of nearly all such groups identified in this study, may offer a strong innovation incentive to patent holders who expect to contribute multiple patents to a single pool. In fact, such rough-and-ready rules may more efficiently encourage repeat players to innovate than would complex collective valuation procedures, such as voting over key decisions.

D. Patent Assessors

Two organizations analyzed in this study compensated innovators based purely on the valuations of patent assessors selected by the group.[179] Because these two groups offered patent contributors a voice in valuation decisions, they most clearly support the Theory of Collective Patent Valuation.

The first patent pool to include an assessor was the 1917 Manufacturers Aircraft Association ("MAA"), an organization formed to facilitate the production of military aircraft during the First World War.[180] The MAA's membership agreement included the following provision, which dictated how such assessments would be made:

> When a "Subscriber" shall hereafter acquire a United States airplane patent, or any right thereunder, he shall be entitled to compensation for the use thereof if the patent or patent right covers an invention which secures the performance of a function not before known to the art . . . or is otherwise of striking character or constitutes a radical departure from previous practice . . . . Such report and claim shall be submitted to a Board of Arbitration to be selected in the manner provided for in paragraph XIII hereof, which Board shall determine whether such compensation shall be paid, and, if so, the total amount thereof and the rate of royalty, or other payments, which shall be paid . . . .[181]

When the MAA formed, industry and government regulators were concerned that this provision's compensation scheme would unfairly allow the group's founders to access new patents for uncompetitively

179. HC Technique oil refining (1933) and aircraft (1917). *See infra* Appendix.
180. Form Agreement Issued by the MAA (Jul. 24, 1917) (on file with author).
181. *Id.*

low prices.[182] Prompted by these concerns, the U.S. Attorney General conducted an investigation of the MAA in 1917.[183] The Attorney General acknowledged that the compensation scheme could harm competition, but also noted that it served a useful purpose by "keeping the patents of each of the subscribers open to all."[184] In light of this, he stated that any concerns about the agreement's potential for abuse "scarcely justif[y] its condemnation in the absence of such abuse."[185]

The second example of an organization employing patent assessors demonstrates a unique solution to the problem of patent valuation. In 1933, multiple oil companies held overlapping patents on a valuable process of oil refining.[186] To avoid litigation, the companies cross-licensed these patents to each other on a royalty-free basis.[187] To reward the owners of any after-acquired patents, the companies agreed to a two-tiered pricing approach in which arbitrators divided royalties only if the members could not come to an agreement on their own first.[188] Here, the assessors were a "backup" only to be relied upon when ordinary bargaining failed.

These two groups offered newcomers a surprising amount of influence over their potential profits. The MAA's membership agreement tasked an internal board of arbitrators with determining which (if any) future innovations were of a "striking [enough] character" to merit compensation.[189] The board was to be composed of three individuals: one elected by the inventor seeking compensation, a second elected by the MAA's board of directors, and the third chosen by the other two arbiters.[190] At least two of the three arbiters had to agree for any decision to become effective.[191]

A slightly different representative voting system was used in the HC Technique Agreement among the oil refiners.[192] Unlike the MAA, the HC Technique Agreement relied on representative voting as a backup, only to be used in situations where members of the group were unable to agree upon a fair division of royalties:

> [T]he parties shall endeavor to agree as to a fair division of royalties with respect to said [after-acquired patent rights] and, failing such agreement, the parties

182. *See* Mfrs. Aircraft Ass'n — Antitrust Laws, 31 Op. Att'y Gen. 166, 170 (1920).
183. *Id.* at 166–67.
184. *Id.* at 170.
185. *Id.*
186. *See* HC Technique Agreement, *supra* note 163.
187. *See id.*
188. *See id.*
189. MAA, *supra* note 180.
190. *Id.*
191. *Id.*
192. *See supra* notes 186–90 and accompanying text.

> agree to submit the question of a fair division of the royalties to a board of five arbitrators, one of whom shall be slected [sic] by each of the parties [to the pool] and the other two shall be selected by the said three arbitrators.[193]

As in the MAA, a majority vote of the arbitrators was required for any royalty-sharing decision to pass.[194] This system granted prospective contributors a limited degree of control over the royalties they could collect via the vote cast by the arbitrator they selected.[195]

E. Royalty-free Licensing and Cost Savings

Many patent pools offer important cost savings to their members. These savings include access to shared patent rights, immunity from challenges to patent validity, and joint funds to offset litigation and patent prosecution costs. The desire to lower costs may explain why patent holders voluntarily join licensing collectives that offer limited control over royalties, and in some cases, no royalties at all.

Nine institutions examined in this study were not structured to collect or to distribute royalties to patent holders.[196] Instead, these groups were formed purely to reduce the risk of patent infringement litigation by requiring each member to provide every other member a royalty-free license to its covered patent rights. As one would expect, these agreements were formed by companies that were both licensors and prospective licensees — that is, they manufactured potentially infringing products but also held patents of their own.

The royalty-free institutional design was first adopted by the Automobile Manufacturers Association ("AMA") — one of the most significant patent licensing collectives in industrial history.[197] Formed in 1914 by a set of leading automobile manufacturers, the AMA at one time pooled rights to over one thousand automobile patents contributed by hundreds of members.[198] As a condition of membership,

---

193. HC Technique Agreement, *supra* note 163.

194. *See id.*

195. *See id.*

196. Royalty-free licensing organizations related to the following subject matter: neglected tropical diseases (2012), HIV (2010), CleanTech (2010, 2008), Linux operating system (2005), gene fragments (1999), Bluetooth wireless data (1997), color cinematography (1934), and automobiles (1907). *See infra* Appendix.

197. *See* VAUGHAN, *supra* note 1, at 62–64 (characterizing the AMA as an "outstanding" historical example of patent pooling and examining the history of its licensing practices).

198. *Investigation of Concentration of Economic Power: Hearings Pursuant to Public Resolution No. 113 Before the Temp. Nat'l Econ. Comm.*, 75th Cong. 302 (1938) (testimony of Alfred Reeves, Vice President and General Manager, AMA) ("One thousand fifty-eight live patents are in the cross-licensing agreement at the present time.") [hereinafter Investigation of Concentration of Economic Power]; *id.* at 685–91 (listing all members of the organization between 1915 and 1940).

automobile makers who joined the AMA promised not to sue one another for patent infringement and were required to license all of their relevant patent rights on a royalty-free basis to all other members.[199] As such, the group was structurally incapable of channeling royalties to would-be innovators.

As a corollary to its institutional design, the AMA did not seek to acquire patent rights to future innovations: Each time the organization's massive cross-license was renewed, the contract explicitly excluded patents that members might obtain in the future.[200] The AMA's president testified in a 1938 congressional hearing that this limitation was intended to appease members who were reluctant to part with future patent rights, the value of which was as yet unknown.[201] As a consequence, the AMA did not encourage innovation by offering prospective inventors the promise of collecting royalties.

A 1935 royalty-free licensing group related to petroleum refining provides another helpful example.[202] The group's five founding members — all large oil companies — promised to grant non-transferable licenses to a newly formed corporation that acted as the licensing administrator.[203] The members received no royalties or "moneys" in exchange for these licenses.[204] Instead, each received royalty-free access to all patents contributed by the other members and royalty-free access to any future patents acquired by the corporation.[205] Access to patent rights was the main inducement to join.

Contemporary royalty-free patent licensing collectives follow a similar format. A recent example is a European-based organization called the Medicines Patent Pool ("MPP").[206] Founded in 2010 and endorsed by the World Health Organization, the MPP solicits royalty-free patent licenses on HIV drugs for use in under-developed countries.[207] Like the AMA, the MPP does not channel royalties to its

199. Form Agreement issued by AMA (undated) (on file with author). *See also* Investigation of Concentration of Economic Power, *supra* note 198, at 300 (testimony of Alfred Reeves, Vice President and General Manager, AMA) ("There is no money royalty involved of any kind. It is a quid pro quo.").

200. *See* Investigation of Concentration of Economic Power, *supra* note 198, at 291 (this appears to have been due to a "belief that somebody might get out some very good patents they wanted to keep for themselves").

201. *See id.*

202. Agreement between Phillips Petroleum Co., The M. W. Kellogg Co., The Texas Co., Standard Oil Co. (Indiana), and Standard Oil Development Co. (Sep. 1, 1935) (on file with author).

203. *See id.*

204. *Id.*

205. *Id.*

206. *See About the MPP*, MEDICINES PATENT POOL, http://www.medicinespatentpool.org/about (last visited May 7, 2014).

207. *See id*; *see also* Mattioli, *supra* note 3, at 121–25 (discussing the origin and development of the MPP).

members.[208] As a consequence, its administrators have opted to seek licenses for only existing patents covering currently marketed drugs, rather than commitments to license future inventions.[209]

Another recent example of royalty-free licensing is the World Intellectual Property Organization's ("WIPO") Re:Search patent licensing initiative. Formed in 2011, this organization aims to facilitate the royalty-free licensing of patent rights relevant to neglected tropical diseases.[210] Contributors to Re:Search — which as of this writing include the pharmaceutical juggernauts Pfizer, GlaxoSmithKline, and Merck — agree to license relevant patent rights to specific licensees on a royalty-free basis.[211] Like the AMA and the MPP, Re:Search does not channel royalties to its contributors.[212] Moreover, the organization leaves any licensing of future technologies up to individual bargaining.[213] The director of Re:Search, who commented for this Article, explained that this approach spurs innovation by permitting downstream inventors to "control the prices they wish to charge for future patent rights."[214]

Royalty-free patent licensing has also taken root in the field of computer software. The Open Invention Network ("OIN"), a software patent licensing group, is a prime example.[215] Financially backed in 2005 by IBM, Novell, Philips, Red Hat, and Sony,[216] the group's form agreement requires its members to license to all other members specific classes of software patents related to the Linux operating system free of charge.[217] The OIN's standard membership agreement, requires all members to "grant to each Licensee . . . a royalty-free, worldwide, nonexclusive, non-transferable license under [their] Patents for making, having made, using, importing, and Distributing any

208. License Agreement Between Gilead Sciences and MPP (Jul. 11, 2011) (on file with author) (describing "a royalty-free, non-exclusive, non-transferable license" to "make, use, offer to sell and sell" certain Gilead patents for use in specific countries) [hereinafter MPP Gilead Agreement].

209. *See Patent Status of ARVs*, MEDICINES PATENT POOL, http://www.medicinespatentpool.org/patent-data/patent-status-of-arvs (last visited May 7, 2014) (listing twenty-six drugs the MPP seeks to facilitate licensing of patent rights to).

210. *Guiding Principles of WIPO Re:Search*, WIPO RE:SEARCH, http://www.wipo.int/research/en/about/guiding_principles.html (last visited May 7, 2014) (stating that contributors to the Re:Search project "agree to grant Users royalty-free licenses . . . to make or have made" the patented technologies).

211. *Id.*; *WIPO Re:Search Members*, WIPO RE:SEARCH, http://www.wipo.int/research/en/about/members.html (last visited May 7, 2014) (listing all members of the organization).

212. *Guiding Principles of WIPO Re:Search*, *supra* note 210.

213. *See id.*

214. Telephone Interview with Thomas Bombelles, Director of WIPO Re:Search (Dec. 16, 2012).

215. Steve Lohr, *Company To Start Offering Free Use of Patents It Holds*, N.Y. TIMES, Nov. 10, 2005, http://www.nytimes.com/2005/11/10/business/10linux.html.

216. *Id.*

217. Form Agreement issued by the OIN (undated) (on file with author), *available at* http://www.openinventionnetwork.com/pat_license_agreement.php (last visited May 7, 2014).

Linux System . . . ."[218] The Agreement defines the "Linux System" as only encompassing software with existing functionality.[219] Thus, like all of the royalty-free licensing groups examined in this study, the OIN delivers a fixed return of "zero" to its members and focuses exclusively on facilitating licenses for patent rights to existing technologies rather than for future innovations.

Some patent licensing groups not only grant their members access to mutually held patents, but also grant them access to patents owned by non-member licensees. For instance, the RFID standard license discussed earlier requires that any licensee holding an essential patent is required to make the patent available to members on "fair, reasonable and non-discriminatory terms."[220] The MPEG-2, DVD, and Bluetooth licensing groups provide similar terms.[221]

In addition to affording their members access to patented technologies, most of the groups examined in this study discourage invalidity suits directed at members' patents. This was most commonly achieved through contractual terms that allowed termination of collective agreements with licensees who challenged the validity of any patent in a portfolio.[222] Like American pioneers "circling the wagons," these groups marshaled a defensive force that can only be accomplished through cooperation.

Another cost reduction made possible by many patent pools, unrelated to royalty-free status, is access to shared legal funds. A majority of the episodes examined by this Article allocated incoming royalties to help members defend infringement and invalidity suits and to fund prosecution of new patent applications. This practice dates back to the earliest patent pool examined in this Article — the 1856 Singer Collective — which provided that all incoming royalties "shall be set apart as a patent fund until it amounts to ten thousand dollars, to be used for the protection and enforcement of [the pooled] patents."[223] Over time, the uses for such funds expanded. For instance, the 1900 Seeded Raisin Company provided "a fund of not less than five thousand ($5000.00) dollars for the specific purpose of paying counsel

---

218. *Id.*

219. *Id.* (citing *Linux Definitions*, OPEN INVENTION NETWORK (effective as of Mar. 7, 2014), http://www.openinventionnetwork.com/pat_linuxdef.php).

220. Form Agreement issued by RFID Consortium LLC (undated) (on file with author); RFID Letter, *supra* note 169.

221. MPEG-2 Agreement, *supra* note 166; DVD Letter, *supra* note 171; Form Agreement Issued by Bluetooth SIG, Inc. (undated) (on file with author).

222. *See, e.g.*, RFID Consortium LLC, *supra* note 220 ("The grant of rights to any Portfolio Patents may be withheld or withdrawn . . . if . . . Portfolio Licensee or its Affiliates challenges the validity or enforceability of any Participant Portfolio patent . . . .").

223. Singer Agreement, *supra* note 129. Any excess was divided among the participants. *Id.*

retainers and fees and expenses of litigation, acquiring inventions and letters patent, and securing patents upon such inventions . . . ."[224]

Ultimately, the value of joining many patent licensing groups lies more in cost savings than in the promise of compensation.

IV. IMPLICATIONS FOR THEORY AND POLICY

A. Implications for Theory

The foregoing study reveals significant gaps between the Theory of Collective Patent Valuation and actual industry practices. To explore these gaps, it is helpful to briefly revisit the motivation behind this study: Our patent system today faces a pricing problem. In order to develop new technologies, innovators must gain access to patented "building blocks" that are already owned by numerous patent holders — a costly task, made prohibitively costly by the risk of holdouts.[225] A perennially debated solution to this "anticommons" problem is compulsory patent licensing. Under a compulsory regime, a court or some other organ of the state would set the royalties that patent holders receive.[226] Although this solution could reduce transaction costs and holdout risks, it would introduce a new cost: Denying patent holders the power to influence the royalties they collect would create a risk of under-compensation that could, in turn, limit innovation investments.[227]

Against this troubling backdrop, some commentators have hypothesized that the market can and will help itself.[228] Proponents of this theory posit that patent pools will naturally emerge to reduce transaction costs by bundling complementary patent rights.[229] At the same time, the theory goes, by permitting inventors to have a say over the royalties they collect, patent pools would encourage innovation more effectively than would a compulsory licensing regime.[230] This would be possible through collective valuation procedures — e.g., voting over critical decisions that influence royalty sharing, such as the choice to include a new patent and the amount of royalties a new patent would command.[231] This study examined whether this Theory of Collective Patent Valuation accurately describes the design of any patent pools in practice.

---

224. Seeded Raisin Agreement, *supra* note 136.
225. *See supra* Part II.A.
226. *Supra* Part II.B.
227. *Id.*
228. *See supra* Part II.C.
229. *See supra* text accompanying notes 17–21.
230. *See id.*
231. *See supra* note 17 and accompanying text.

This study's most important finding is that most patent pools have not been designed as forums for collective patent valuation. For instance, the twenty "ex ante bargain" patent pools were not even designed to incorporate new patent rights over time.[232] Instead, all of these groups pertained exclusively to patents in existence at the time of group formation.[233] Likewise, the nine royalty-free patent pools identified in this study were limited to patents or to well-defined technologies in existence at the time of pool formation.[234] These limitations reflect the fact that many patent pools have not been designed to encourage innovation, but rather, to facilitate the licensing of existing technologies.

Those patent pools that were designed to incorporate new patents over time seldom offered inventors any influence over their royalties. In the fifteen share-based patent pools, patents were exchanged for stock that periodically yielded dividends.[235] The bylaws of these corporations show that their founders contemplated including new patent rights over time.[236] However, the decisions that affected patent valuation — e.g., whether to acquire a new patent and how many shares of stock its owner should receive — were not made collectively by shareholders.[237] Thus, like ex ante bargains and royalty-free pools, share-based patent pools do not support the Theory of Collective Patent Valuation.

Ultimately, only two organizations supported the Theory of Collective Patent Valuation: the MAA and the 1935 patent pool composed of oil companies.[238] Because these organizations were built to acquire more patents over time, and because they permitted patent holders to elect the representatives who influenced the division of royalties, they satisfy the Theory's requirements.[239]

But perhaps the Theory of Collective Patent Valuation need not apply in order to get the desired benefits of reduced transaction costs, lowered holdout risk, and increased innovation incentives. Indeed, formula-based patent pools offer an important alternative to pools that meet the Theory's requirements: "Rough-and-ready" rent-sharing rules even appear to be preferable to collective patent valuation procedures in some situations. Because such rules may be just as likely to over-compensate patent holders as they are to under-compensate them, they may provide a fair aggregate return after repeated interac-

232. *Supra* Part III.A.

233. *Id.*

234. *See, e.g.*, AMA, *supra* note 199; OIN, *supra* note 217 (limiting OIN to software patents that cover "existing functionality" of the Linux Operating System).

235. *See infra* Appendix (identified as having the "corporate shares" profit allocation model).

236. *See supra* Part III.B.

237. *Id.*

238. *See supra* Part III.D.

239. *Id.*

tions. Moreover, these rules are simple to administer and appear to require less coordination than a more complex voting procedure would require. Although these rules may encourage some companies to innovate, enthusiasm for this approach should be tempered: The companies most likely to profit from this "game" are those that own enough patents to participate multiple times.

A second alternative approach yields important cost savings without even attempting to collectively value patents. Many patent pools are structured to provide their members with access to valuable pools of patents and knowhow as well as access to after-acquired patent rights of licensees. Many also provide patent contributors access to joint funds designed to offset the costs of enforcing or defending patent rights, and to help pay for prosecuting new patent applications. It appears that the benefits of joining some patent pools relate more to savings than to compensation.

The foregoing observations can be reduced to a digestible set of insights: There is little support for the Theory of Collective Patent Valuation. To the contrary, many patent pooling agreements are not designed to include new patent rights over time. Most of those that *are* capable of including new patents over time do not offer their members any power to influence the royalties they collect. In lieu of collective valuation procedures, an increasing number of such patent pools are turning to rough-and-ready royalty-sharing rules that appear to benefit repeat players. Thus, some patent pools may indeed be capable of encouraging innovation, but the incentive is likely only strong for companies that have enough patents to play the game multiple times. Smaller patent holders may still be drawn to patent pools for benefits unrelated to compensation, however, such as access to shared patent rights and litigation funds.

These conclusions do not disprove the theory that patent pools encourage innovation. However, they do show that the role of collective behavior in our patent system is far more complex than theorists have predicted. The link between institutional design and innovation has long been unappreciated, in large part, because patent pooling agreements are not visible to policymakers or to the public.

B. A Proposal for the Recording of Patent Pooling Agreements

This Article's findings show that private institutions have long had a significant and largely unappreciated impact on innovation incentives and returns. However, as explained in Part II, policy efforts to reform the patent system have generally focused on the institutions that define it — namely, the PTO and the Federal Circuit. In order to better encourage innovation, future patent reform efforts should be informed by the role of private institutions. To that end, I propose that

Congress enact legislation that would mandate (or alternatively, encourage) the recording of patent pooling agreements with a federal agency.

Patent pools are changing the rules of innovation. Our patent system is premised on the theory that innovation is encouraged by offering inventors limited monopoly pricing power.[240] However, this study has shown that patent holders are increasingly ceding this power — sometimes in whole and sometimes just in part — to gain membership to private licensing communities.[241] In some industries, joining such groups may be a necessary prerequisite to providing certain services or products.[242] Consequently, the incentive to innovate is increasingly defined by private rules.

Because collective patent agreements are usually private, the impact of collective action on innovation has been poorly understood. As this study has shown, the realities of collective governance are far more varied and complex than theorists have appreciated. Some patent pools are focused on lowering the cost of producing existing products.[243] Others hold no promise of royalties but deliver important cost savings.[244] Some patent pools may be capable of encouraging innovation, but through rough-and-ready rules rather than carefully-tuned voting regimes.[245] These insights come only from records that could be located; the true number of patent licensing collectives that have existed in the past is unknown, as are the full number and nature of any such groups that operate in secrecy today. It is striking how much will remain unknown about the internal governance of these organizations in the future if the historical lack of public reporting continues.

A new law designed to encourage the recording of collective patent licenses would be an important first step in redirecting policy efforts; such a law would inform policymakers of the total number of patent licensing groups that operate in various industries, and the institutional forms such groups have adopted. With the benefit of this information, policymakers would be better able to understand how collective action influences the incentive to innovate. This knowledge will be essential to crafting new policies that maximize innovation, economic prosperity, and social welfare.

What would a patent agreement recording law look like? A congressional bill proposed nearly eighty years ago provides a good model. In January of 1935, H.R. 4523 was introduced in the House of

240. *See supra* notes 28–36 and accompanying text.

241. *See supra* Part III.

242. *See* Merges, *supra* note 11, at 1295–96 (discussing the increasing number and complexity of collective rights organizations).

243. *See supra* notes 206–09 and accompanying text.

244. *See supra* Part III.E.

245. *See supra* Part III.C.

Representatives with the title "A Bill Providing for the Recording of Patent Pooling Agreements and Contracts with the Commissioner of Patents."[246] The core of the bill required the following:

> That every agreement by which rights in a plurality of patented inventions are rendered subject to common ownership, control, or enjoyment, whether by assignment, license, or otherwise . . . shall be recorded in the Patent Office within six months from the date thereof. . . . That any change or addition in the parties or patents involved in the agreements recorded as hereinbefore provided and any changes in the provisions of such agreements shall be fully set forth and duly recorded in the Patent Office within three months of the date thereof.[247]

Had this law been enacted, it would have imposed civil penalties on any person or organization that failed to comply with its provisions.[248] However, the bill did not provide details on how compliance would be monitored.[249]

During the winter and spring of 1935, a special Committee on Patents investigated the possible usefulness of H.R. 4523 by interviewing a wide spectrum of patent holders — from some of the largest corporations in the country down to individual inventors.[250] The Committee observed that some patent pooling arrangements are "beneficial . . . to the general public welfare," while others are used to carry out "secret and sinister [goals] . . . prejudicial to public interest."[251] In its final report, the Committee concluded that "the recordation of such agreements in the United States Patent Office, and in the Federal Trade Commission would seem to be the best method of preventing such secret and sinister operations."[252] However, for reasons that are unclear from the legislative history the bill never advanced beyond the committee stage.

If introduced today, a bill modeled on H.R. 4523 would solve several problems. First, and most importantly, such a law would provide much-needed information to policymakers. As mentioned earlier, patent reform legislation efforts have largely focused on the institu-

246. *See generally Pooling of Patents: Hearings on H.R. 4523 Before the H. Comm. on Patents*, 74th Cong. (1935).
247. *Id.* at 1.
248. *Id.*
249. *See generally id.*
250. *See generally id.*
251. *Id.* at 1197.
252. *Id.*

tions that apportion patent rights.[253] Patent pools, the internal structure of which is often unknown, redefine these rights in several respects. If policymakers are to make intelligent decisions, it seems they must have a clearer understanding of the impact of these private regimes.

A second positive outcome of this proposal relates to its impact on contracting behavior. If such a law made patent pooling contracts available to the general public, it could indirectly place public pressure on patent holders to form pools that are forward-looking by design. By the same token, the new law would also discourage restric-restrictive pooling agreements that slow the pace of innovation (to the extent such pools are not already prohibited by applicable antitrust law).

While the foregoing reasons show why a bill like H.R. 4523 could very well gain the necessary political goodwill to be enacted into law, large patent holders might oppose a law that mandates the recording of private agreements. Thus, a gentler approach may be needed. The National Cooperative Research and Production Act ("NCRPA") — a federal law passed in 1984 — provides a model for a more moderate approach.[254] The law offers reduced antitrust penalties to research consortia that inform the DOJ and the Federal Trade Commission of their operations.[255] An attorney with the DOJ who commented for this Article explained that "although the law does not require consortia to file their membership agreements under the Act, many do so in hopes of receiving favorable business reviews from the Department of Justice."[256] Thus, the NCRPA encourages the recording of research agreements with a carrot rather than a stick. A patent agreement recording law would do well to adopt a similar design.

Drafters of a patent agreement recording law would have several important factors to consider. First, they would need to decide whether to mandate or merely encourage the recording of collective patent agreements. While a mandatory recording law could yield the most information, it might also face the greatest opposition from certain constituencies. Moreover, a mandatory recording law could spur collaborators to search for paths to cooperation that do not involve formal contracts (e.g., non-assertion pledges). This wasted activity would represent efficiency losses. For this reason, lawmakers might prefer a gentler approach that mirrors the NCRPA's reductions in antitrust penalties in return for compliance. Compliance could also be encouraged through novel incentives such as an expedited review of patent applications submitted by members of participating organizations.

---

253. *See supra* Part II.B.

254. *See generally* National Cooperative Research and Production Act, 15 U.S.C.A. §§ 4301–05 (1984).

255. *See id.* at §§ 4304–05.

256. Telephone Interview with U.S. Dep't of Justice Attorney (Jan. 12, 2012).

Second, lawmakers would need to decide where recorded agreements should be submitted and who would have access to them. Two prime choices are the DOJ and the PTO. The DOJ already reviews similar agreements in connection with requests for antitrust business review letters and agreements submitted in connection with the NCRPA.[257] Moreover, if the bill proposed here were to offer a reduction in antitrust penalties, it would fall squarely within the DOJ's purview. Thus, the DOJ appears to have a strong existing framework for receiving and analyzing patent pooling agreements.

By contrast, the PTO could be a good custodian for different reasons. Unlike the DOJ, the PTO has a long history of receiving, reviewing, and storing vast collections of patent-related information.[258] From this perspective, it could make sense for the PTO to collect related patent pooling agreements. The PTO has also long published periodic reports on patent application filings and grants.[259] A new avenue of business for the office could be the publishing of reports on the number and nature of patent pooling agreements in operation across the country. The PTO's institutional competency and internal resources could thus make it a strong choice for overseeing the collection of patent pooling agreements.

The very existence of the NCRPA and H.R. 4523 indicates that this proposal could be both useful and achievable. To be sure, like any legislative proposal, such a bill would probably face some opposition. The most vocal opponents would likely be those with the most to lose: companies that perceive strategic advantages in keeping their patent pooling operations secret. Moreover, policing and enforcing compliance with such a law could create new administrative costs. However, as explained above, a moderate approach that solicits rather than mandates the recording of collective patent licenses should quell such criticism. At the same time, lawmakers, experts, and many industry stakeholders might rally in support of a law that would shed light on the transformative but often hidden practice of collective patent licensing.

V. CONCLUSION

From the outside, many patent pools look remarkably alike: All are private organizations whose members own patents that relate to a particular field. Most pools offer outsiders access to their patents in exchange for royalties. As voluntary organizations, patent pools ap-

257. *See Filing a Notification Under the NCRPA*, U.S. DEP'T OF JUSTICE, http://www.justice.gov/atr/public/guidelines/ncrpa.html (last visited May 7, 2014).

258. *See, e.g.*, *Calendar Year Patent Statistics*, U.S. PATENT AND TRADEMARK OFFICE, http://www.uspto.gov/web/offices/ac/ido/oeip/taf/reports.htm (last visited May 7, 2014).

259. *See id.*

pear to offer benefits that outweigh members' desires to engage in independent and unmediated market transactions.

In light of the limited information available on the inner workings of these groups, it is understandable that legal scholars and policymakers have long viewed them as, by and large, alike. This mindset is evident in the very fact that commentators continue to use the blanket term "patent pool" to describe nearly any cooperative effort involving patent holders. Likewise, it is not surprising that theorists have assumed that, like many collective rights organizations, patent pools reflect the collective will of their members — specifically with respect to the collective valuation of property rights. This assumption is particularly appealing because it offers an elegant solution to the pricing problem that afflicts our patent system.

This study of such collectives has shown, however, that the realities of collective patent licensing are far more varied than theory predicts. Most strikingly, there is little empirical support for the theory that patent pools act as forums for collective patent valuation. To the contrary, many such groups are not designed to include new patent rights over time. Those that are capable of including new patents over time generally do not grant their members any voice in royalty sharing.

Although patent pools seldom offer their members the power to influence royalties, some appear to offer an unexpected innovation incentive to repeat players. By adopting "rough-and-ready" royalty-sharing rules that are undemocratic by design, some patent pools offer an efficient means of cooperation that does not require cumbersome collective valuation procedures such as voting over key group decisions. Although these crude formulas may undervalue some patents, they may also overvalue other patents, thus potentially yielding a fair return for those patent holders who can afford to participate a sufficient number of times — i.e., those possessing many patents and a strong innovation pipeline. Rough-and-ready royalty sharing is in widespread use in standards-based patent pools today and appears to be growing in popularity as of this writing.

A second unexpected discovery is that cooperation among patent holders may often be motivated more by the promise of savings than by a quest for compensation. Such savings are rooted in promises of immunity from patent infringement and invalidity suits, as well as access to collective funds set aside to defend, enforce, and prosecute patent rights. The recent popularity of royalty-free patent licensing demonstrates that such benefits can inspire and sustain cooperation on their own.

The foregoing conclusions suggest significant refinements to theory. Importantly, these findings also signal the need for policy measures to improve the amount and quality of information available

about collective patent licensing. The forces that will cause patent licensing collectives to form in the future, the degree of control such groups afford their members, and the means by which wealth is shared are pressing questions that cannot be easily studied without such information.

The ongoing paucity of information on this subject represents more than a roadblock for theorists — it fosters a policy blind spot that threatens to frustrate the efforts of lawmakers and regulators more and more as patent pools become more prevalent. Private collectives are increasingly defining the roles that patents play in our society, but policymakers will remain uninformed about their nature and impact unless recording requirements make them visible.

A new patent agreement recording law designed to encourage the filing of collective patent licenses with a federal agency such as the PTO or the DOJ is a promising solution to this problem. Although this plan might face some opposition, there is reason to believe that Congress would approve it today just as the Committee of Patents did when the proposal was last investigated in the 1930s. This solution would be an effective, achievable, and relatively inexpensive way to shed light on collective patent licensing — a phenomenon that is powerfully and silently defining the future of innovation.

APPENDIX

Table 1: Patent Licensing Collectives Examined

Year	**Subject Matter**	**Profit Allocation**
1856	Sewing Machines	fixed sums
1866	Steel-Making (Bessemer Process)	fixed percentages
1877	Steel-Making (Bessemer Process)	corporate shares
1890	Steel-Making (Bessemer Process)	corporate shares
1890	Farming Tools	corporate shares
1895	Pneumatic Straw Stackers	fixed sums
1899	Footwear	corporate shares
1899	Bathtubs	fixed sums
1900	Seeded Raisins	fixed percentages
1907	Automobiles	royalty-free

Year	Subject Matter	Profit Allocation
1909	Liquid Door Checks	fixed percentages
1913	Bicycle and Motorcycle Brakes	fixed sums
1916	Beds	fixed percentages
1916	Automobile Bumpers	fixed percentages
1917	Aircraft	expert valuations
1919	Radio	corporate shares
1921	Oil Refining (Cracking Process)	fixed percentages
1924	Flat Glass	fixed percentages
1926	Peach Pitting	corporate shares
1929	Coated Abrasives	corporate shares
1930	Water Conditioning	corporate shares
1931	Rail Joint Bars	fixed percentages
1933	Oil Refining (Gray Process)	fixed percentages
1933	Oil Refining (HC Technique)	expert valuation
1933	Hydraulic Oil Pumps	fixed percentages
1933	Machine Tools	corporate shares
1934	Lecithin Production	corporate shares
1934	Variable Condensers	fixed percentages
1934	Color Cinematography	royalty-free
1935	Petroleum Refining	corporate shares
1935	Plexigum	fixed percentages
1938	Pour Depressants	fixed percentages
1938	Fuse Cutouts	fixed percentages
1938	Furniture Slipcovers	fixed percentages
1943	Air Conditioning	corporate shares
1949	Elastic Stockings	fixed percentages
1952	Wrinkle Finishes	corporate shares

Year	**Subject**	**Profit Allocation**
1955	Women's Hosiery	corporate shares
1956	Fiberglass	corporate shares
1997	MPEG-2 Video	Formula
1997	Wireless Data (Bluetooth)	royalty-free
1998	Digital Video Discs (DVD)	Formula
1999	Gene Fragments	royalty-free
1999	Data Transfer (IEEE 1394)	Formula
2001	Mobile Communications (3G)	Formula
2004	Digital Video (H.264)	Formula
2005	Linux Operating System	royalty-free
2008	CleanTech	royalty-free
2008	Wireless Data (RFID)	Formula
2010	CleanTech	royalty-free
2010	HIV	royalty-free
2012	Neglected Tropical Diseases	royalty-free